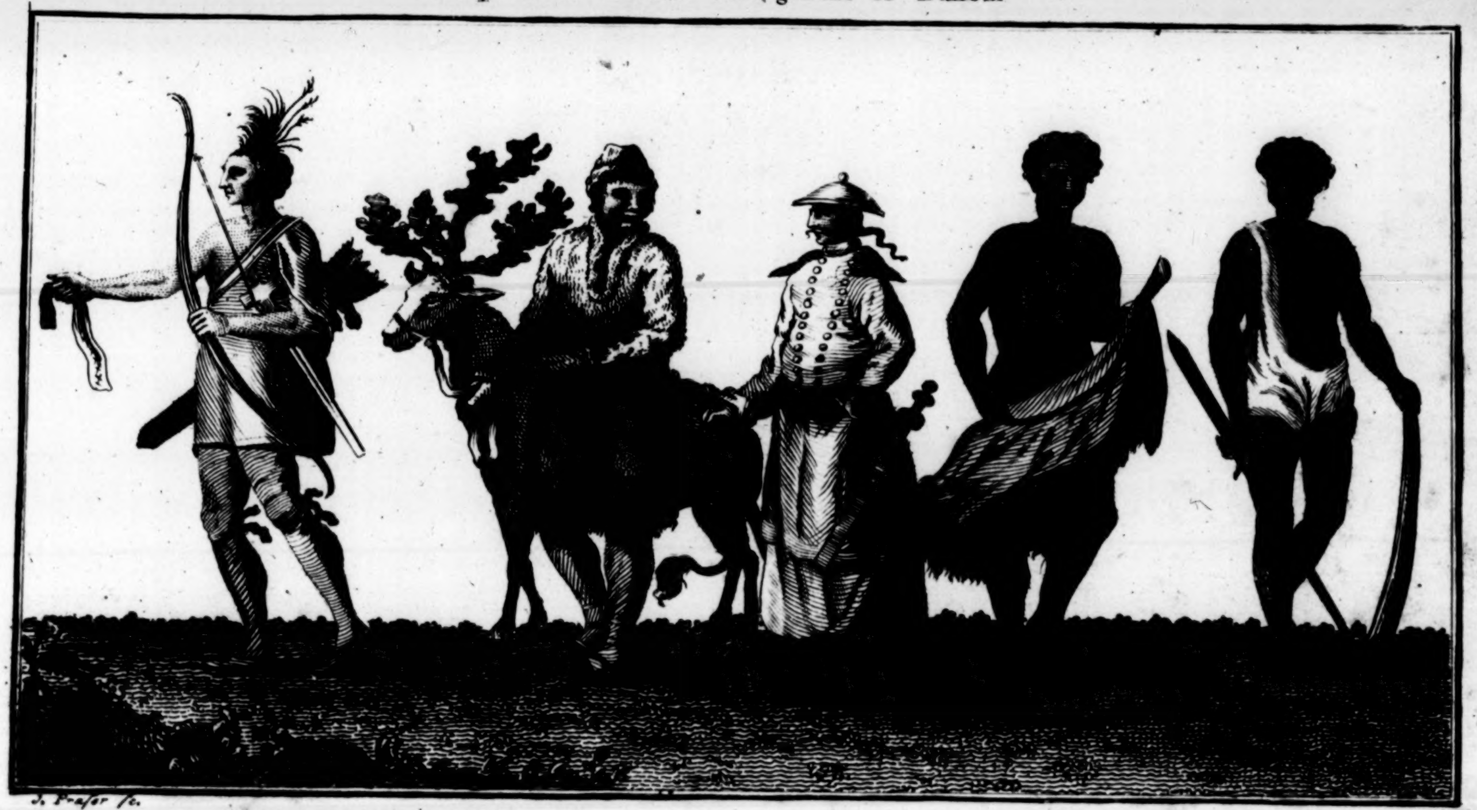
Frontiſpiece to Moriſon's abridgement of Buffon.



J. Fraſer ſc.

AMERICAN. LAPLANDER. CHINESE. HOTTENTOT. AFRICAN.

Frontiſpiece to Moriſon's abridgement of Buffon.

J. Fraſer ſc.

x Le Clerc (G.L.)

THE
SYSTEM
OF
NATURAL HISTORY,

WRITTEN BY THE CELEBRATED

BUFFON,

CAREFULLY ABRIDGED;

WITH

ADDITIONAL EXTRACTS

FROM OTHER WRITERS.

EMBELLISHED WITH

NEAR FIFTY ELEGANT COPPER-PLATES.

IN TWO VOLUMES.

VOLUME FIRST.

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PREFACE.

NATURAL Hiſtory, is of all ſciences the moſt important, and extenſive. Its object is, to obſerve and claſſify the various appearances of nature, as they preſent themſelves ſpontaneouſly, while undiſturbed by the intervention of human art. The general phænomena of the univerſe, the wonders of the heavens, the form and ſtructure of the earth, animals, vegetables, foſſils, and inanimate bodies of all ſpecies, fall, therefore, under its obſervation. Whatever can be diſcovered of any of theſe, by an attentive ſurvey, or by carefully watching thoſe changes to which they are naturally ſubject, is recorded by the naturaliſt, in order that it may be added to the materials of ſome other ſcience or ſome art, or that it enlarge the general experience of mankind. No ſooner have we entered this world, than we begin to obſerve the appearances of nature: we attend to them in infancy with eager curioſity: a conſiderable acquaintance with them is neceſſary to fit us for the buſineſs of life, when we advance to manhood; the operator in every art, and the votary of whatever ſcience muſt ſearch in one department or another of Natural Hiſtory, for the materials of which every ſyſtem of ſcience is conſtructed, and the facts, by induction from which, the rules of every art are formed.

Although thus important, thus extenſive, and thus generally intereſting, it was late in the progreſs of knowledge, before natural hiſtory aſſumed a regular form, or began to be cultivated as a diſtinct branch of ſcience. Many theories of the earth and heavens had been imagined; the ſcience of ethics had been ſucceſsfully cultivated in all its different branches; the moſt important theorems in mathematics had been demonſtrated, and the moſt intricate problems ſolved; when Ariſtotle, the father of natural hiſtory, firſt attempted to collect a body of facts belonging to this department of knwledge, and to arrange them in ſcientific order. Taſte and genius had paſſed their meridian at Rome, when the elder Pliny collected that medley of precious ſcience and idle fancies, of fact and fable, which is the only valuable work upon natural hiſtory that the remains of Roman literature afford. And, in modern times, the heroes of almoſt every other ſcience had paſſed, before Buffon and Linnæus appeared.

But, if natural hiſtory did not, till a late period begin to aſſume a regular form, or to command the attention of the votaries of knowledge; it has at length become a favourite ſtudy with almoſt all claſſes of men. The philoſopher finds no taſk more pleaſing or more dignified, than to watch and compare the habits and manners of plants and animals. The virtuoſo rejoices in the poſſeſſion of a ſhell, a ſkeleton, or a ſtuffed ſkin, no leſs than in a ruſty medal, a faded picture, or a mutilated ſtatue. The painter, and the engraver have exhibited ſome of the fineſt ſpecimens of their reſpective arts in imitating the forms and colours of birds and quadrupeds. And what a numerous train of writers have lately ſought fame or emolument by illuſtrating ſubjects of natural hiſtory.

Linnæus and Buffon, the chief of theſe laſt, have equally diſplayed in their works, ſome of the higheſt efforts of genius; although differing as much in their views, and manner of compoſition, as is poſſible for two able writers, upon the ſame train of ſubjects. The one has reduced natural hiſtory to the auſtere regularity of ſcientific method; while the other has diſplayed its materials in a looſe order, and arrayed them in all the pomp of popular eloquence. The one has formed a new claſſification, and invented a new ſyſtem of technical language, as apparatus for his favourite ſcience: the other, in compliance with the taſte of his country, and the turn of his own genius, has endeavoured to ſtrip natural hiſtory of whatever is remote from popular expreſſion and popular ideas, and to teach her thoſe blandiſhments which invite and inſinuate, and attract the notice, and even the regard even of the gay, the careleſs, and the indolent. Buffon, like Deſcartes, Helvetius, Rouſſeau, and moſt of the other eminent philoſophers of France, intermixes ill-founded, and fantaſtic theory, in a large proportion, with extenſive and enlightened views of nature, and the moſt beautiful delineations of facts. Linnæus ſeems to have propoſed to himſelf to form ſimply an index to thoſe parts of the volume of creation which are open to human view. Both are eminently eloquent; but the eloquence of Buffon is copious, diffuſive, and often declamatory, and redundant: while Linnæus is remarkably conciſe and energetic. Yet, whatever may be their comparative merits, Buffon will long continue one of the moſt popular writers on ſcientific ſubjects: but, it is not probable, that the volumes of Linnæus, whether in the crude, German Latin, in which they were originally written, or tranſlated into any of the vernacular languages of Europe, will ever be fondly peruſed by any but men of ſcience.

Theſe views of the importance and extent of natural hiſtory, of the ardour with which it is, at preſent cultivated, and of the character of the moſt popular of the capital writers upon the ſcience, firſt ſuggeſted the idea of the PRESENT ABRIDGEMENT. It ſeemed probable, that the work of M. de Buffon might become ſtill more popular, and by conſequence, more generally uſeful, if it could be reduced to a leſs bulky and leſs expenſive form. It was natural to obſerve, that of thoſe who are deſirous of acquiring ſome knowledge of natural hiſtory, or of amuſing themſelves with the contemplation of the objects which it preſents, many are unwilling to be detained by theory, however plauſible, to liſten to amplifying declamation, or to perplex themſelves with examining authorities, or balancing the evidence on the different ſides of diſputed facts. To the young it is peculiarly proper to recommend the ſtudy of natural hiſtory; and nothing but a detail of intereſting facts, in eaſy, correct, and perſpicuous language can be put, with any proſpect of utility, into their hands.

The compiler of this Abridgement has been guided by theſe conſiderations in the performance of his taſk. He has rejected, as far as was practicable, without deſtroying the contexture of the work, all ſuch of M. de Buffon's theories as appeared to him, plainly ill-founded and fanciful: he has left out that diſplay of authorities, which M. de Buffon had not always confined to his notes, but frequently introduced into the text; and he has often condenſed his author's diffuſe deſcriptions of the forms and manners of animals, and abbreviated his narrative of hiſtorical facts relative to them. He has at the ſame time anxiouſly endeavoured to make this abridgement, a regular work having conſiſtency and connexion through all its parts, not an awkward heap of incoherent fragments. He hopes, that his language will not be found to be much more incorrect than that of either of the Engliſh tranſlations of M. de Buffon's work. In the latter part ſome additions are introduced from other writers.

If this publication ſhall contribute, in any degree, to render the knowledge of natural hiſtory more eaſily attainable, and to extend the reputation of M. de Buffon, the wiſhes of the Abridger and the Publiſhers will be fully gratified.

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OMITTING the theories of other writers with regard to the earth, we ſhall take notice of ſuch facts as have been univerſally acknowledged, together with thoſe additional ones which have come within the ſphere of our own obſervation.

The ſurface of this globe preſents us with heights, depths, plains, ſeas, marſhes, rivers, caverns, gulfs, volcanoes, in the diſpoſition of which, upon a ſlight view we obſerve neither regularity nor order. If we penetrate into the bowels of the earth, we diſcover metals, minerals, ſtones, bitumens, and, in ſhort, matter of every kind as it were without any apparent deſign. Upon a more accurate inſpection we perceive matter in every form, blended in a chaos of confuſion, which can be compared to nothing but the ruins of a world.

Amid theſe ruins, however, the different generations of animals, and of vegetables ſucceed each other in a beautiful and regular order. With reſpect to us, the earth, formerly a chaos, is now become a delightful habitation, where every object affords amazing diſplays of the power, of the intelligence and of the beneficence of its great Creator.

In examining and deſcribing the ſurface of the earth, the firſt object which ſolicits our attention, is that body of water with which the greater part of the globe is covered. The waters occupy the lower grounds, and, notwithſtanding their uniform tendency to reſt, they are kept in continual agitation by an agent, that communicates to them a regular periodic motion which produces a vibration, even to the moſt profound depths, in the whole maſs.

When we explore the bottom of the ſea, we diſcover hills and valleys, plains and hollows, and rocks and earths of every ſort. We diſcover too that iſlands are only the ſummits of vaſt mountains; we likewiſe find other mountains whoſe tops almoſt reach the ſurface of the water; and rapid currents which counteract the general movement; and of which the motion is ſometimes in the ſame direction, and at other times retrograde. On the one hand, we meet with tempeſtuous regions, where the heavens and the ocean ſeem equally confounded in the general ſhock; violent inteſtine emotions, tumultuous ſwellings, waterſpouts, and ſtrange convulſions produced by volcanoes; and dreadful whirl-pools. On the other hand, we diſcover vaſt regions always calm, but equally dangerous to the mariner. In ſhort when we direct our eyes towards the polar regions, we perceive huge maſſes of ice, which having detached themſelves from them, advance, like floating mountains until they diſſolve in the temperate climates.

Beſides theſe grand objects, the ocean exhibits an infinite variety of animated beings; all of which find abundance of food in this fluid element.

But when we take a view of the land: what differences take place in different climates! what a variety of ſoils! what inequalities in the ſurface! Yet upon an attentive obſervation, we obſerve that the great chains of mountains lie nearer the equator than the poles; that, in the old Continent, their direction is more from eaſt to weſt than from north to ſouth. And the figure and direction of theſe mountains which appear moſt irregular, correſpond, ſo that the prominent angles of one mountain are conſtantly oppoſite to the concave angles of the neighbouring mountain, and of equal dimenſions, whether they be ſeparated by an extenſive plain or a ſmall valley. I have alſo remarked that the oppoſite are almoſt always of the ſame height; and that mountains for the moſt part occupy the middle of continents, iſlands and promontories, and that they divide them by their greateſt lengths. By tracing the courſes of the principal rivers too, I find that their direction is nearly perpendicular to the ſea-coaſts into which they empty themſelves, and that for the greater part of their courſes they follow the direction of the mountains from which they take their riſe. The ſea coaſts are generally bordered with earth and ſand accumulated by the waters of the ſea, or ſwept down by rivers. In oppoſite coaſts, ſeparated only by ſmall arms of the ſea, the different ſtrata are of the ſame materials. Volcanoes never exiſt but in high mountains; a great number of them are entirely extinguiſhed; ſome are connected with others by ſubterraneous paſſages, and their eruptions pretty frequently happen at the ſame time. Similar communications ſubſiſt between certain lakes and ſeas. Some rivers diſappear on a ſudden and ſeem to precipitate themſelves into the bowels of the earth. Certain inland ſeas too conſtantly receive from many rivers prodigious quantities of water, and which as their bounds are not augmented, probably diſcharge thoſe extraneous ſupplies by ſubterraneous paſſages. Countries that have been long inhabited may likewiſe be eaſily diſtinguiſhed from thoſe where the earth appears in a rude ſtate, where the rivers are full of cataracts, where the land is either almoſt overflowed with water, or ſcorched with drought, and where every place where a tree can grow is covered with wood.

In our examination of the upper ſtratum of the earth, we find it to be univerſally the ſame ſubſtance, which ſubſtance is nothing elſe than a compoſition of the decayed parts of animal and vegetable bodies. Penetrating a little deeper, we diſcover the real earth, beds of ſand, lime ſtone, clay, ſhells, marble, gravel, chalk, &c. Theſe ſtrata are always parallel to one another, and of the ſame thickneſs throughout. In neighbouring hills, ſtrata of the ſame materials are uniformly divided by perpendicular fiſſures. Shells, ſkeletons of fiſhes, marine plants, &c. perfectly ſimilar to thoſe of the ocean, are often found in the bowels of the earth, and on the tops of mountains at very great diſtances from the ſea. Petrified ſhells are found almoſt every where in prodigious quantities, not only incloſed in rocks of marble and limeſtone, in earths and in clays, but incorporated and filled with the very ſubſtances in which they are incloſed. Indeed all marbles, lime ſtones, chalks, marles, clays, ſand, and almoſt all terreſtrial ſubſtances, are full of ſhells and other ſpoils of the ocean.

From theſe facts, let us try what concluſions can be drawn.

The changes which the earth has undergone for the laſt two or three thouſand years, are inconſiderable, when compared with thoſe revolutions which ſucceed the creation. For as the ſurface of the earth was at firſt much ſofter than it is now, of conſequence the ſame cauſes which at preſent produce but ſlight alterations for many centuries, were then capable of producing very great revolutions in a few years. It is very evident, in my opinion, that the dry land, and even the ſummits of the higheſt mountains, were formerly covered with the waters of the ſea; becauſe ſhells and other marine animals are ſtill found upon the very tops of mountains. It appears too that the waters of the ſea have remained a great number of years upon the ſurface of the earth; for ſuch immenſe banks of ſhells have been diſcovered, as to render it impoſſible for ſo great a number of animals to have exiſted at the ſame time. This circumſtance proves pretty clearly, that, though the materials on the ſurface of the earth were then eaſily diſunited by the water; yet theſe tranſportations could not be ſuddenly effected. Even though it ſhould be ſuppoſed, that, at the deluge, all the ſhells were tranſported from the bottom of the ocean and depoſited upon the dry land; yet, beſides the difficulty of eſtabliſhing this hypotheſis, it is evident, that as ſhells are found incorporated in marble, and in the rocks of the higheſt mountains, we muſt likewiſe ſuppoſe that all theſe marbles and rocks were formed at the ſame time, and that too when the deluge took place; and that before this grand revolution, there were neither mountains, nor marbles, nor rock, nor clays, nor matter of any kind like that with which we are now acquainted.

But without dwelling any longer upon this particular, I ſhall confine myſelf to well authenticated facts. It is certain, that the waters of the ſea have, at one period or other, continued for a ſucceſſion of ages upon what we now know to be dry land; and that, of conſequence, the vaſt continents of Aſia, Europe, Africa, and America, were then the bottom of an immenſe ocean, replete with every thing which the preſent one produces. It is alſo certain that the different ſtrata of the earth are horizontal and parallel to one another; which ſituation is occaſioned by the operation of the waters. The horizontal poſition of water is almoſt univerſal: in plains the ſtrata are perfectly horizontal. And it is only in the mountains that they are inclined to a horizon; becauſe they have been originally formed by ſediments depoſited upon an inclined baſe. Now theſe ſtrata muſt have been formed gradually; for nothing is more frequent than ſtrata compoſed of heavy materials placed above light ones, which could not have been the caſe, if the whole had been blended and diſſolved by the deluge, and then precipitated.

Another circumſtance requires our attention. Nothing but the motion and ſediments of water could poſſibly produce the regular poſition of the various ſtrata of which the ſuperficial part of this earth is compoſed. And as both the higheſt mountains, and the loweſt vallies conſiſt of parallel ſtrata, this parallel and horizontal poſition of ſtrata muſt be the effect of an uniform and conſtant cauſe. And hence we conclude that the dry and habitual part of the earth has remained a long time under the waters of the ſea, and muſt therefore have undergone the ſame changes which are at preſent going on at the bottom of the ocean. By examining therefore what paſſes in the bottom of this ſea, we ſhall ſoon be able to draw ſome rational concluſions reſpecting the external figure and internal conſtitution of the earth.

The ocean, ſince the creation of the ſolar ſyſtem, has been ſubject to a regular flux and reflux. This motion which uniformly takes place twice in twenty four hours, is principally owing to the moon, and is greater in the equatorial regions than in other climates. The earth too performs a rapid motion on its axis, and conſequently has a centrifugal force, which is alſo the greateſt at the equator; which laſt circumſtance proves that the earth muſt be more elevated under the equator than at the poles. From the tides, therefore, and the motion of the earth combined, we may fairly conclude, that, though this globe had originally been a perfect ſphere, its diurnal motion, and the ebbing and flowing of the tides, muſt, in a ſucceſſion of time, have elevated the equatorial parts, by gradually carrying mud, ſhells, &c. from other climates, and depoſiting them at the equator. On this hypotheſis, the the greateſt inequalities on the earth's ſurface ought to be found and indeed are found near the equator. But farther, as the alternate motion of the tides has been regular ſince the exiſtence of the world, may we not naturally imagine that, at each tide the water carries from one place to another a ſmall quantity of matter, which falls to the bottom as a ſediment, and forms thoſe horizontal and parallel ſtrata that every where appear.

It may, however, be objected that as the flux is equal to, and regularly ſucceeded by the reflux, the two motions will balance one another, and, of conſequence, that this cauſe of the formation of ſtrata muſt be chimerical, as the bottom of the ocean can never be affected by a uniform alternate motion of the waters.

But, in the firſt place, the alternate motion of the waters is far from being equal, as the ſea has a continual motion from eaſt to weſt, and alſo as the agitations occaſioned by the winds, produce great inequalities in the tides. By every motion of the ſea too, particles of earth and other materials, muſt be carried from one place and depoſited in another; and theſe collections of matter muſt aſſume the form of parallel and horizontal ſtrata. Beſides on all coaſts where the ebbing and flowing are diſcernible, numberleſs materials are brought in by the flux, which are not carried back by the reflux. Thus the ſea gradually increaſes on ſome places, and recedes from others. But in order to remove every doubt, let us examine more cloſely the practicability of a mountain being formed at the bottom of the ſea, by the motion and ſediments of the water. On a coaſt which the ſea laſhes with violence, ſome part of the earth muſt be carried off by every ſtroke of the waves. Even where the ſea is bounded by rock, it is a well authenticated fact, that ſmall particles are carried off from the rock by the retreat of every wave. Thoſe particles of earth or ſtone being tranſported to ſome diſtance; it happens that, when the agitation of the water is abated, the particles are precipitated in the form of a ſediment, and lay the foundation of a firſt ſtratum which will ſoon be ſucceeded by a ſimilar one. In proceſs of time this gradually accumulating maſs will become a mountain in the bottom of the ſea, perfectly like, both in external and internal ſtructure the mountains on the dry land. When the bottom of the ſea too, at particular places, is troubled by the agitation of the water, earth, clay, ſhells, and other matter, muſt be removed from thence, and depoſited elſewhere. For divers aſſure us, that the bottom of the ſea, at the greateſt depths to which they deſcend, is ſo ſtrongly agitated by the water, that earth, clay and ſhells are removed to great diſtances. Tranſportations of this kind muſt therefore go on in every part of the ocean; and the matters tranſported, after having ſubſided, muſt raiſe eminences ſimilar to the compoſition and ſtructure of our mountains. We muſt not however imagine that theſe matters cannot be carried to a great diſtance; for we daily find grain, and other productions of the Eaſt and Weſt Indies landing on our coaſts. Theſe bodies may be ſaid to be ſpecifically lighter than the water, and the other ſubſtances ſpecifically heavier. Yet as they are reduced to an impalpable powder, they may be long ſuſpended in the water, and conſequently tranſported to any diſtance.

It has been imagined that the agitation, produced by the winds and tides, does not affect the bottom when it is very deep. But the truth is, that whatever be the depth, the power which occaſions the flux and reflux operates equally upon every particle of the maſs at the ſame time. It therefore appears that the tides, the winds, and whatever elſe gives birth to motion in the ſea, muſt produce heights and inequalities in its bottom; and that theſe eminences muſt uniformly be compoſed of regular ſtrata, either horizontal or inclined.

Whenever eminences are formed, they interrupt the uniform motion of the waters, and produce new ones called currents. Between two neighbouring heights in the bottom of the ocean, there muſt be a current, which will follow their common direction, and, like a river cut a channel, the angles of which will be alternately oppoſite through the whole of its courſe. Theſe heights muſt continually increaſe, as the water will depoſite its ordinary ſediment upon their ridges; and thus by means of the different motions and ſediments, the bottom of the ocean, though formerly ſmooth, muſt ſoon be furrowed, and interſperſed with hills and chains of vaſt mountains, as we find it at preſent. And the materials which conſiſted of ſandy and cryſtalline particles, would produce thoſe maſſes of rock and flint in which we find cryſtals and other precious ſtones. Others compoſed of ſtony particles and ſhells, produce lime-ſtone and marble; and laſtly particles of ſhells mixed with a pure earth, have given riſe to all our beds of marle and chalk.

It may be ſaid however that the greater number of hills, whoſe ſummits conſiſt of ſolid rocks of moor ſtone, or marble, are founded upon ſmall eminences compoſed of lighter materials. But the explication of this phœnomenon is perfectly eaſy. The waters would firſt operate upon the upper ſtratum, either of coaſts, or the bottom of the ſea. This upper ſtratum generally conſiſts of clay or ſand; and theſe light ſubſtances being carried off and depoſited ſooner than the more denſe and ſolid, they would of conſequence become foundations for the more heavy particles to reſt upon. The harder and more ponderous ſubſtances would next be ſubjected to the attrition of the water, and carried off and depoſited about the hillocks of ſand or clay. Theſe ſmall ſtony particles would, in proceſs of time, form thoſe ſolid rocks which we now find on the tops of hills and mountains. And as particles of ſtone are heavier than thoſe of either ſand or clay, it is probable that they were originally covered by ſuperior ſtrata of conſiderable depth; but that they now occupy the higheſt ſtations, becauſe they were laſt tranſported by the waves.

To confirm this reaſoning, it is worthy of remark, that, the different ſtrata of ſtones in quarries are almoſt all horizontal or regularly inclined Indeed the ſtrata of granite, vitrifiable ſand, clays, marbles calcareous ſtones, chalk, and marles, are always parallel or equally inclined. And, the diſpoſition of ſtrata, as deep as mankind have penetrated is the ſame.

Thoſe beds of ſand and gravel which are waſhed down from the mountains, muſt, in ſome degree be excepted from the general rule. And as they are formed by rivers and brooks which often change their channels, it is not ſurprizing that they are ſo frequent. The ſtrata formed by rivers are not very ancient; they are eaſily diſtinguiſhed by their frequent interruptions, and the inequality in thickneſs, which is conſtantly varying, but the ancient ſtrata uniformly preſerve the ſame dimenſions throughout. Theſe modern ſtrata may likewiſe be diſtinguiſhed by the form of the ſtones and gravel they contain, which bear evident marks of having been rounded by the motion of water. The ſame obſervation holds good with reſpect to thoſe beds of turf, and corrupted vegetables, which are found in marſhy grounds, immediately below the ſoil; and which have derived their origin from ſucceſſive accumulations of decayed trees, and other plants. The ſtrata of ſlime and mud being formed by ſtagnating waters, or the inundations of rivers, are neither ſo perfectly horizontal, nor ſo uniformly inclined, as thoſe produced by the regular motions of the ſea. In ſtrata formed by rivers, we meet with river and ſeldom with ſea ſhells; but in the ancient ſtrata there are no river ſhells; the ſea ſhells are numerous, well preſerved and all placed in the ſame manner. From whence could this beautiful regularity proceed? Inſtead of regular ſtrata, why do we not find the materials which compoſe the earth huddled together without order? Why are not rocks, marbles, clays, marles, &c. ſcattered promiſcuouſly, or joined by irregular or vertical ſtrata? Why are not heavy bodies found in a lower ſituation than light ones? It is eaſy to perceive, that this uniformity of nature, this ſpecies of organization, this union of different materials by parallel ſtrata, without regard to their weights could only proceed from a cauſe equally powerful and uniform as the motions of the ſea, produced by regular winds, or by the flux and reflux, &c.

As theſe cauſes act with ſuperior force under the equator than in other climates, the chains of mountains are moſt extenſive in its neighbourhood. Thus the mountains of Africa and Peru are both the higheſt and moſt extenſive in the world. The mountains of Europe and Aſia, which extend from Spain to China, are not ſo high as thoſe of Africa and South America. Beſides, in the northern ſeas, the iſlands are but few, when compared with thoſe in the Torrid Zone. As iſlands, therefore, are nothing but the ſummits of mountains, it is clear that there are more inequalities on the ſurface of the earth, near the equator than in northerly climates.

Thoſe vaſt chains of mountains which run from weſt to eaſt in the old continent, and from north to ſouth in the new, muſt have been formed by the general motion of the tides. But the origin of the ſmaller mountains and hills may be aſcribed to particular motions occaſioned by winds, currents, and other irregular agitations of the ſea, or to a combination of all thoſe motions, which are capable of infinite variations.

But how has it happened, that this earth, which, from time immemorial, has been an immenſe continent, ſhould, if formerly the bottom of an ocean, be now ſo much elevated above the waters, and ſo compleatly ſeparated from them?

A little reflection will furniſh us with at leaſt, plauſible ſolutions. We daily obſerve the ſea gaining ground on certain coaſts, and loſing it on others. The ocean has a general and uniform motion from eaſt to weſt; there are whole provinces which human induſtry can hardly defend from the fury of the waves, and there are iſlands which have but lately emerged from the waters, and regular inundations. Hiſtory too informs us of inundations and deluges of a more extenſive nature. Should not all this convince us, that the ſurface of the earth has undergone very great revolutions, and that the ſea may have given up the greater part of the ground which ſhe formerly poſſeſſed? Let us ſuppoſe for example, that the old and new worlds were formerly but one continent, and that, by a violent earthquake, the ancient Atalantis of Plato was ſunk. What would be the conſequence? The ſea would ruſh in from all quarters, and from what is now called the Atlantic Ocean, and vaſt continents would of conſequence be left dry. This great revolution might be effected by the ſudden failure of ſome immenſe cavern in the interior part of the globe, and an univerſal deluge would infallibly ſuceeed. I am inclined however to think, that to effect ſuch a revolution would require a very long period. Be theſe conjectures as they may, it is certain that the revolution has happened, and I believe it has happened naturally. It is a well authenticated fact that the ocean has a conſtant motion from eaſt to weſt; which motion like the trade winds, is not only perceived between the tropics, but through the whole temperate climates, and as near the poles as navigators have approached. In conſequence of this motion, the Pacific Ocean muſt make continual efforts againſt the coaſts of Tartary, China and India; the Indian Ocean muſt act againſt the eaſt coaſt of Africa; and the Atlantic muſt operate in a ſimilar manner upon the eaſtren coaſts of America. Hence the ſea has gained, and will always gain on the eaſt and loſe on the weſt. If ſuch is the natural effect of the motion of the ſea from eaſt to weſt, may we not ſuppoſe that Aſia, and all the eaſtern continent is the moſt ancient country in the world? and that Europe and part of Africa, particularly the weſt parts of theſe continents, as Britain, France, Spain, &c. are more recent countries? Both hiſtory and phyſics, concur to eſtabliſh this hypotheſis.

But there are many lands lower than the level of the ſea, and defended only by banks, which the action of the waters muſt gradually deſtroy, and of conſequence the lands muſt then become part of the ocean. The mountains too are daily diminiſhing; and every little brook carries earth, and other materials from the high grounds into the rivers, by which they are at leaſt tranſported to the ocean. Thus the bottom of the ſea is gradually filling up, and the ſurface of the earth is approaching to a level.

But we ſhall give a detail of facts in order to explain the different alterations which the earth has undergone, whether by irruptions of the ſea upon the land, or by the ſea returning from lands which it formerly occupied.

That irruption which gave birth to the Mediterranean is no doubt the greateſt. The motion through the ſtraits of Gibraltar is contrary to the motion in every other ſtrait; for the general motion of the ſea is from eaſt to weſt; but in the ſtraits of Gibraltar it is from weſt to eaſt. This circumſtance is a clear proof that the Mediterranean Sea is not an ancient gulf, but that it has been formed by an irruption, produced by ſome accidental cauſe.

When the ocean forced this paſſage, it ran through the ſtraits with much more rapidity than it does now, and immediately deluged that large tract of land which formerly joined Europe with Africa. The waters covered all the grounds which were lower than the level of the ocean; and no part of them is to be ſeen at preſent, except the tops of ſome of the mountains, ſuch as part of Italy, Sicily, Malta, Corſica, Sardinia, Cyprus, Rhodes, and the iſlands of the Archipelago.

It is not improbable, that the Black Sea will, ſome time or other, be entirely divided from the Mediterranean; and that the Boſphorus will be choaked up, whenever the rivers ſhall have accumulated a quantity of materials ſufficient for that purpoſe.

The Caſpian and Black Seas ſhould rather be conſidered as lakes than as gulfs of the ocean; becauſe they are perfectly ſimilar to other lakes that receive a number of rivers without any viſible outlet, as the Dead Sea, ſeveral lakes in Africa and elſewhere.

But that we may give ſome recent examples of the changes of ſea into land and of land into ſea. At Venice the bottom of the ſea is conſtantly riſing. And the ſame thing may be ſaid, of moſt harbours, bays, and mouths of rivers. In Holland the bottom of the ſea is elevated in many places, the gulf of Zudovzee and the ſtraits of the Texel, cannot receive ſuch large veſſels as formerly; and it is quite evident that the ſea is always damned up, wherever great rivers empty themſelves. The Rhine is loſt in the ſands which itſelf has accumulated. The Danube, the Nile, and all large rivers, after they have tranſported great quantities of ſlime, ſand, &c. never arrive at the ſea by a ſingle channel. Marſhes are drained every day; lands, forſaken by the ſea, are now plowed and ſown; we navigate whole countries now covered by the waters. In ſhort, we ſee ſo many inſtances of land changed into water, and water into land, as to convince us that, in time, the gulfs of the ocean will become continents; the iſthmuſes will be changed into ſtraits; and the tops of the mountains converted into ſhoaly rocks in the ſea.

Still, however, thoſe perpendicular fiſſures, which are equally diffuſed through rocks, clays, and every conſtituent material of the globe, remain to be conſidered. The perpendicular fiſſures are indeed placed at greater diſtances from one another, than the horizontal; and the ſofter the matter, the more diſtant are the fiſſures. In marble and hard ſtone, the fiſſures are only a few feet aſunder. If the maſs of rock be extenſive, the diſtance between the fiſſures is ſome fathoms.

The cauſe of perpendicular fiſſures is eaſily inveſtigated. As various materials conſtituting the different ſtrata were tranſported by the waters, and depoſited in the form of ſediments, they would at firſt be in a very diluted ſtate, and would by degrees harden and part with the ſuperfluous quantity of water they contained. In the proceſs of drying, they would contract and ſplit at irregular diſtances. The contraction, therefore, of the parts in drying is the cauſe of perpendicular fiſſures; for I have often remarked, that the ſides of thoſe fiſſures, through their whole extent, correſpond as exactly as the two ſides of a ſplit piece of wood.

Perpendicular fiſſures vary greatly as to the extent of their openings. It is clear, however, that the fiſſures, whoſe openings are ſmall, have been occaſioned ſolely by drying. But thoſe which extend ſeveral feet are partly owing to the ſinking of the foundation upon one ſide while that of the other remains firm. When rocks are founded on clay or ſand, they ſometimes ſlip a little to a ſide; and the fiſſures are of conſequence increaſed by this motion. I have not taken notice of thoſe prodigious cuts which are found in rocks and mountains, and which could be produced by nothing but the ſinking of immenſe ſubterraneous caverns that were unable to ſupport the load any longer. But theſe cuts in mountains are not of the ſame nature with perpendicular fiſſures: They appear to have been ports opened by the hand of nature for the communication of nations. This appears to be the intention of all large openings in chains of mountains, and of thoſe ſtraits by which different parts of the ocean are connected; as the ſtraits of Thermopyle, of Gibraltar, &c. the gaps or ports in Mount Caucaſus, the Cordeliers, &c.

Theſe great ſinkings, though owing to accidental and ſecondary cauſes, are leading facts in the hiſtory of the earth, and have contributed much to change the appearance of its ſurface. Moſt of them have been produced by ſubterraneous fires, whoſe exploſions give birth to earth-quakes and volcanoes. But though the force of inflamed matter pent up in the bowels of the earth be great, and though its effects appear to be prodigious, we cannot ſuppoſe that theſe ſubterraneous fires are only branches of an immenſe abyſs of flame in the center of the earth: nor do we believe that thoſe fires have their ſeat at a great depth below the ſurface, as matter cannot begin to burn, or at leaſt the inflammation cannot be ſupported without air. In order to be convinced that the matter emitted by volcanoes does not come from any conſiderable depth, we have only to attend to the height of the mountain, and to conſider the amazing force which would be neceſſary to project ſtones and minerals to the height of half a league; for Ætna, Hecla, and other volcanoes have at leaſt that elevation.

This, however, is not inconſiſtent with volcanoes being the cauſe of conſiderable earthquakes; nor does it contradict the communication of one volcano with another, by means of ſubterraneous paſſages. For to produce an earthquake in a plain, it is not neceſſary that the bottom of the volcano ſhould be below the level of that plain, nor that there ſhould be ſubterraneous cavities filled with the ſame burning matter under it. A violent exploſion may by its reaction produce an earthquake of conſiderable extent. I would not, however, be thought to ſay that no earthquakes derive their exiſtence from ſubterranean fires; all I mean is that there are earthquakes produced ſolely by the exploſion of volcanoes.

It is not difficult to account for volcanoes appearing only in mountains; for greater quantities of minerals, ſulphur, and pyrites exiſt in mountains and nearer the ſurface than in the plains. Beſides mountains are more ſubject to the impreſſions of the air, and receive more rain and moiſture, by which mineral ſubſtances are capable of being fermented to ſuch a degree as to produce actual inflammation. And mountains having diminiſhed, nearly in proportion to the quantity of matter thrown out is another proof that the volcanoes are not ſo deep as the baſe of the mountains, and even that they are not much below the ſummit.

In ſeveral places, earthquakes have formed conſiderable hollows, and even ſome large gaps in mountains. All other inequalities are coeval with the mountains themſelves, and owe their exiſtence to currents in the ocean.

From what has been ſaid, it is eaſy to perceive how much ſubterraneous fires have contributed to change both the ſurface and internal part of the globe. But it is difficult to conceive how any ſenſible alteration upon the land can be produced by the winds. Their dominion would appear to be confined to the ſea; yet it is well known that the winds raiſe mountains of ſand in Arabia and Africa; and that they frequently carry theſe ſands many leagues into the ſea, where they form banks, downs, and even iſlands. Every body knows that hurricanes are the ſcourge of the Antilles, of Madagaſcar, and of other countries, and that their impetuoſity is ſo violent as to drive back rivers, to overthrow rocks and mountains, to ſcoup out holes and gulphs in the earth, and totally to change the face of thoſe unhappy countries which they infeſt.

But the greateſt changes upon the ſurface of the earth are produced by rains, rivers, and torrents from the mountains. Theſe derive their origin from vapours raiſed by the ſun from the ſurface of the ocean, and which are tranſported by the winds through every climate. The progreſs of theſe vapours is interrupted by the tops of the mountains, where they accumulate into clouds, and deſcend in the form of rain, dew, or ſnow. By their intrinſic gravity, they ran to the bottom of the mountains, and penetrating or diſſolving the lower grounds, they ſwept along with them ſand and gravel, furrowed the plains, and thus opened paſſages to the ſea, which always gains as much water by rivers, as it loſes by evaporation. The windings in the channels of rivers uniformly have correſponding angles on their oppoſite banks; and, as mountains and hills, which may be conſidered as the banks of the vallies by which they are ſeparated, have alſo ſinuoſities with correſponding angles, this circumſtance ſeems to demonſtrate, that the vallies have gradually been formed by currents of the ocean, in the ſame manner as the channels of rivers have been produced.

The waters which run upon the ſurface, compoſe perhaps not one half of the quantity that is produced by vapour. In almoſt all the vallies and low grounds, at a certain depth, water is uniformly to be found; but, in high grounds, it is impoſſible to extract water from the bowels of the earth. There are extenſive countries, where no wells can be obtained. In the eaſt, and eſpecially in Arabia, Egypt, and Perſia, wells and ſprings are ſeldom to be met with. To ſupply their place, the inhabitants have been obliged to make large reſervoirs to collect the rain water. In plain countries, furniſhed with large rivers, it is almoſt impoſſible to break the ſurface of the earth without finding water.

The greateſt part of the water ſo liberally diffuſed through low grounds, comes from the neighbouring hills and eminences. During great rains, or the ſudden melting of ſnow, part of the water runs upon the ſurface; but moſt of it penetrates the earth and rocks by ſmall chinks and fiſſures. It emerges indeed as ſoon as it can find an opening; but it often creeps along until it can find a bottom of clay, or hard earth, and there forms ſubterraneous lakes, brooks, and perhaps rivers, whoſe channels are conſigned to eternal oblivion.

There are ſeveral lakes which neither receive nor give origin to any river. A greater number, however, receive no conſiderable river, but are the ſources of the largeſt in the world. Such are the lakes from which the river St Laurence ariſes; the lake Chiame, from which two large rivers proceed, that water the kingdoms of Aſem, and Pegu; the lakes of Aſſiniboil in America; thoſe of Ozera in Muſcovy; thoſe too which give riſe to the Bog and the Irtis, and many more. It has been affirmed, indeed, that lakes are to be found on the tops of the higheſt mountains; but thoſe found on the Alps, and other elevated ſituations, all derive their origin from the waters which run down the ſides, or are filtered through the bowels of theſe ſuperior eminences.

Hence the exiſtence of ſubterraneous collections of water; for mountains, hills, and heights of every ſort, are expoſed on every ſide to the weather. The waters which fall upon any place of an elevated ſituation, muſt, after penetrating the earth, from the declivity of the ground, break forth at many places, ſprings and fountains: and of conſequence little water will be found in the bowels of mountains. But, in plains, as the water filtrated through the earth can find no vent, it muſt be collected in ſubterraneous caverns, or diſperſed in ſmall veins among ſand and gravel. The bottom of a pit or well is only a ſmall artificial baſon, into which the water inſinuates itſelf from the higher grounds. Hence it is, that, though water may be found in any part of a plain, only a number of wells can be ſupplied in proportion to the quantity of water diffuſed, or rather to the extent of the higher grounds from which it comes.

To find water, it is unneceſſary to dig below the level of the river. Even what is found in the earth below the level of the rivers, is not derived from them. Five or ſix feet of earth is ſufficient to contain water, and to prevent its eſcape.

It would not be eaſy to make an exact calculation of the quantity of ſubterraneous waters that have no apparent iſſue. Many ſuppoſe that it is far greater than all that is upon the ſurface of the earth. But it is probable that the quantity of ſubterraneous waters which never appear at the ſurface, is very inconſiderable; for, if the number of ſubterraneous rivers were ſo great, why do we never ſee any of their mouths break out like ſprings, on the ſurface. But rivers likewiſe produce conſiderable changes on the ſurface of the earth; they carry off the ſoil; they wear away the moſt ſolid rocks, and ſweep off whatever oppoſes them. The ſame effects would reſult from ſubterraneous rivers. But no ſuch changes have ever been diſcovered; the different ſtrata every where preſerve their parallel and primitive poſition.

From what we have advanced, we may conclude, that the flux and reflux of the ocean have produced all the mountains, valleys, and other inequalities on the ſurface of the earth; that currents of the ſea have ſcouped out the valleys, elevated the hills, and beſtowed on them their correſponding directions; that the waters of the ocean too, by

tranſporting

tranſporting and depoſiting earth, &c. have given exiſtence to the parallel ſtrata; that the waters from the heavens deſtroy the effects of the ſea, by diminiſhing the height of the mountains, filling up the vallies, and choaking the mouths of the rivers; and, by reducing every thing to its former level, they will reſtore the earth to the ſea, which, by its natural operations, will again create new continents, beautifully diverſified with mountains and vallies, and in every reſpect like thoſe which we now inhabit.

The ſurface of this globe is divided, from one pole to the other, into two immenſe bands of earth, and two of water. The principal of theſe bands is that which is called the ancient continent, and which includes Europe, Aſia, and Africa. This continent, if meaſured from the two extreme points, that is, from the moſt eaſtern point of Tartary to the Cape of Good Hope, will produce a line of 3600 leagues; and if meaſured directly from north to ſouth, we ſhall find that there are only 2500 leagues from the northern Cape of Lapland to the ſouthernmoſt point of the Cape of Good Hope. The utmoſt breadth of this continent, that is, from the weſtern coaſt of Africa to Trefana, as far as Niſingpo, on the eaſt coaſt of China, is about 2800 leagues.

Another line may be drawn alſo from Breſt in Brittany, as far as the coaſt of Chineſe Tartary, which will be about 2300 leagues. The old continent, on the beſt calculations, may be ſaid to contain 4,940,780 ſquare leagues, which is about a fifth part of the ſurface of the globe, and may be conſidered as a large belt of earth, with an inclination to the equator of about 30 degrees.

The new continent, is called America, and is divided into north and ſouth. Its greateſt length may be eſtimated from the mouth of the river Plata in Paraguay to the lake of the Aſſeniboils, which amounts to about 2500 leagues. It is ſuppoſed to contain 2,140,212 ſquare leagues. The whole ſuperficial contents, therefore, of both the old and new continents are about 7,080,993 ſquare leagues, not near a third of the ſurface of the globe, which contains 25,000,000 ſquare leagues.

Of theſe lines, which divide both the continents into two equal parts, it is worthy of remark, that they both terminate at the ſame degrees of north and ſouth latitude; and that the two continents make mutual advances perfectly oppoſite to one another, to wit, thoſe on the African coaſt, from the Canary Iſles to Guiney; and thoſe of America, from Guiana to the mouth of the Rio-Janiero.

It, therefore, appears, that the moſt ancient lands on the globe, are thoſe which extend from 200 to 250 leagues on each ſide of the two lines that we have already taken notice of. Agreeable to which idea, we conclude, that, in the old continent, the moſt ancient countries of Africa are thoſe which reach from the Cape of Good Hope to the Red Sea and Egypt, and are about 500 leagues broad; and, of conſequence, that the whole weſtern coaſt of Africa, from Guiney to the Straits of Gibraltar, are new lands.

In the new continent we ſhall likewiſe find, that Terra Magellanica, the eaſtern part of Braſil, of the country of the Amazons, of Guiana, and of Canada, are new lands when compared with Tucuman, Peru, Terra Firma, the iſlands in the Gulf of Mexico, Florida, the Miſſiſippi, and Mexico.

It was but a ſmall part of the globe with which the ancients were acquainted. All America, the Arctic circle, Terra Auſtralis the Magellanic, and a great part of the internal regions of Africa, was entirely unknown to them. They knew not that the torrid zone was inhabited, although they had navigated around Africa; for it is 2200 years ſince Neco king of Egypt gave veſſels to the Phœnicians which departed from the Red Sea, coaſted round Africa, doubled the Cape of Good Hope, and having employed two years in this voyage, the third year they entered the ſtraits of Giblratar*. Nevertheleſs, the ancients were not acquainted with the property which the load-ſtone had, of turning towards the poles, although they knew that it attracted iron. They were ignorant of the general cauſe of the flux and reflux of the ſea; they were not certain the ocean ſurrounded the globe without interruption; ſome indeed ſuſpected it, but with ſo little foundation, that no one dared to ſay, or even conjecture it was poſſible to make a voyage round the world. Magellan was the firſt who made it A. D. 1519 in 1124 days. Sir Francis Drake was the ſecond in 1577, and he did it in 1056 days; afterwards Thomas Cavendiſh made this great voyage in 777 days, in the year 1586. Theſe famous voyagers were the firſt who demonſtrated phyſically, the globular form and the extent of the earth's circumference: for the ancients were far from having a juſt meaſure of this circumference, although they had travelled a great deal. The general and regulated winds, and the uſe to be made of them in long voyages, were alſo abſolutely unknown to them; therefore, we muſt not be ſurprized at the little progreſs they made in Geography, ſince at preſent, in ſpite of all the knowledge we have acquired by the aid of mathematical ſciences, and the diſcovery of navigators, many things remain ſtill to be found, and vaſt countries to be diſcovered.

As there is ſo large a portion of the globe with which we are unacquainted, particularly near the poles, where the ice has never permitted any navigator to penetrate, we cannot exactly know the proportion between the ſurface of the earth, and that of the ſea; only as much as may be judged by inſpection of what is known, there is more ſea than land.

If we would have an idea of the enormous quantity of water which the ſea contains, let us ſuppoſe one common and general depth to the ocean; by computing it only at 200 fathom, or the 10th part of a mile, we ſhall ſee that there is water-ſufficient to cover the whole globe to the height of 600 feet of water, and if we would reduce this water into one maſs, we ſhall find that it forms a globe of more than 60 miles diameter.

The form of the earth is not that of a perfect globe, but rather what is termed a ſpheroid, a globe which is flattiſh at the poles, the axis, therefore, or line which may be ſuppoſed to paſs through it at the equator, is to its axis at the poles in the proportion of 230 to 229. The ſolid parts of the earth are formed of beds or ſtrata of different materials, which lie one upon another in a regular order. The firſt ſtratum conſiſts of common ſoil, mixed with a variety of decayed vegetable and animal ſubſtances, and with ſtony and ſandy particles. In different parts of the world the other ſtrata are found to conſiſt of different materials, and differently diſpoſed. In ſome parts the ſtrata are horizontal, in others they are inclined; and veins or fiſſures of metals, coals, and other minerals, frequently penetrate through the different beds or ſtrata to a great depth, and divide them. At Marly-la-Ville, in France, which is a high country, but flat and fertile; the following ſtrata were found arranged horizontally. From the ſhells which were found in N° 16, we may conjecture, that at ſome period the ſoil of Marly-la-Ville was the bottom of the ſea, but has ſince been raiſed to the height of 75 feet.

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* See Herod. Lib. iv.

The ſtate of the various Beds of Earth found at Marly-la Ville, at the depth of 100 feet.

	Feet	Inch.
I. A free reddiſh earth, mixed with much mud, a very ſmall quantity of vitrifiable ſand and ſomewhat more calcinable ſand	13	0
II. A free earth or ſoil mixed with more gravel, and a little more vitrifiable ſand	2	6
III. Dirt mixed with vitrifiable ſand in a very great quantity, and which made but very little effervеſcence with aqua fortis	3	0
IV. Hard marle, which made a very great effervеſcence with aqua fortis.	2	0
V. Pretty hard marly ſtone	4	0
VI. Marle in powder, mixed with vitrifiable ſand	5	0
VII. Very fine vitrifiable ſand	1	6
VIII. Marle in earth, mixed with a little vitrifiable ſand	3	6
IX. Hard marle, in which was real flint	3	6
X. Gravel, or powdered marle	1	0
XI. Eglantine, a ſtone of the grain and hardneſs of marble, and ſonorous	1	6
XII. Marly gravel	1	6
XIII. Marble in hard ſtone, whoſe grain was very fine	1	6
XIV. Marle in ſtone, whoſe grain was not ſo fine	1	5
XV. More grained and thicker marle	2	6
XVI. Very fine vitrifiable ſand, mixed with ſea foſſile ſhells, which had no adherence with the ſand, and whoſe colours were perfect	1	6
XVII. Very ſmall gravel or fine marle powder	2	0
XVII. Marle in hard ſtone	3	6
XIX. Very large powered marle	1	6
XX. Hard and calcinable ſtone like marble	1	6
XXI. Grey and vitrifiable ſand mixed with foſſile ſhells, particularly oyſters and muſcles, which have no adherence with ſand, and which are not petrified	3	0
XXII. White vitrifiable ſand mixed with ſhells	2	0
XXIII. Sand ſtreaked red and white, vitrifiable and mixed with the like ſhells	1	0
XXIV. Larger ſand, but ſtill vitrifiable, and mixed with the like ſhells	1	0
XXV. Grey, fine and vitrifiable ſand mixed with the like ſhells	8	6
XXVI. Very fine fat ſand, where there were only a few ſhells	3	0
XXVII. Free-ſtone	3	0
XXVIII. Vitrifiable ſand, ſtreaked read and white	4	0
XXIX. White vitrifiable ſand	3	6
XXX. Reddiſh vitrifiable ſand	15	9
Total depths when they left off diging	101	ft.

In

Within a trench made at Amſterdam, the earth was dry to the depth of 230 feet, and the ſtrata of earth were found as follows: 7 feet of vegetable or garden earth, 9 feet turf, 9 feet ſoft clay, 8 feet ſand, 4 feet earth, 10 feet ſand, on which it is cuſtomary to fix the piles which ſupport the houſes of Amſterdam; then 2 feet argile, 4 of white ſand, 5 of dry earth, 1 of ſoft earth, 14 of gravel, 8 argile, mixed with earth; 4 of gravel, mixed with ſhells; then clay 102 feet thick, and at laſt 31 feet ſand, at which depth they ceaſed digging.

Every ſtratum, whether horizontal or inclined, has an equal thickneſs through its whole extent: that is to ſay, every bed of any matter whatſoever, taken ſeparately, has an equal thickneſs through its whole extent; for example, when the bed of ſtone in a quarry is three feet thick in one part, it will have the ſame thickneſs throughout: if in one part it is found to be ſix feet thick, it will be ſo throughout. In the quarries about Paris the bed of good ſtone is not thick, and ſcarcely 18 or 20 feet thick; in other quarries, as thoſe of Burgundy, the ſtone is much thicker; it is the ſame with marble; the black and white marble have a thicker bed; the coloured are commonly thinner, and I know beds of very hard ſtone, which the farmers in Burgundy make uſe of to cover their houſes, that are not above an inch thick. The thickneſs of different beds, therefore, are different, but each bed preſerves the ſame thickneſs throughout its extent; in general it may be ſaid, that the thickneſs of the horizontal ſtrata is ſo greatly varied, that it is found from one line and leſs to 1, 10, 20, 30, or 100 feet thick; the ancient and modern quarries which are horizontally dug; the perpendicular and other diviſions of mountains, prove that there are extenſive ſtrata in every direction.

The various ſtrata of which the earth is compoſed, are not diſpoſed according to the order of their ſpecific weight; for we often find ſtrata of heavy matters placed on ſtrata of lighter. To be aſſured of this, we have only to examine the nature of the earth on which rocks are placed, and we ſhall find that it is generally clay which is ſpecifically lighter than the matter of the rock. In hills and other ſmall elevations, we eaſily diſcover the baſe on which rocks are placed; but it is not ſo with large mountains, not only the ſummit is rock, but thoſe rocks are placed on other rocks; there are mountains upon mountains and rocks upon rocks, to ſuch a conſiderable height, and in ſo great an extent of ground, that we can ſcarcely be certain where there is earth at bottom, and of what nature it is. We ſee picked rocks which are many hundred feet high; theſe rocks reſt on others, which perhaps are no leſs ſo; nevertheleſs, may we not compare great with ſmall? and ſince the rocks of little mountains, whoſe baſes are to be ſeen, reſt on earth leſs heavy and ſolid than ſtone, may we not ſuppoſe that the baſe of high mountains is alſo of earth?

In a ſoil where flint is the predominant ſtone, the country is generally fertile, and if the place is uncultivated, and theſe ſtones have been long expoſed to the air, without being moved, the upper ſuperficies is always very white, whilſt the oppoſite ſide, which touches the earth preſerves its natural colour. If the blackeſt, and moſt flinty flint be expoſed to the weather, in leſs than a year, its ſurface will change colour, and if we have patience to purſue this experiment, we ſhall ſee it by degrees loſe its hardneſs, tranſparency, and other ſpecific characters, and approach every day nearer and nearer the nature of argile.

What happens to flint, happens to ſand; each grain of ſand may be conſidered as a ſmall flint, and each flint as a maſs of grains of ſand, extremely fine and exactly grained. The example of the firſt degree of decompoſition of ſand is found in the brilliant and opake powder called *Mica*, in which potters earth and ſlate are always diffuſed. The entirely tranſparent flints, the *Quartz*, produce, by decompoſition, fat and ſoft talc, as petrifiable and ductile as clay: and it appears to me that talc is a mediate term between glaſs or tranſparent flint and argile; whilſt on the contrary, coarſe and impure flint, by decompoſing, paſſes to potters earth without any intermedium.

Our factitious glaſs proves alſo the ſame alterations: it decompoſes in the air, and periſhes in ſome degree by remaining in the earth. At firſt its ſuperficial ſcales exfoliate; by working it we perceive brilliant ſcales fly from it; but when its decompoſition is more advanced, it crumbles between the fingers, and is reduced into a very fine white talcy powder: and art has even imitated nature in the decompoſition of glaſs and flint.

CHAP. II.

OF HILLS—SEAS—RIVERS—AND LAKES—THEIR NATURE AND PROPERTIES.

IF, in place of that beautiful variety of hills and vallies, of verdant foreſts, and refreſhing ſtreams, which at preſent delight our ſenſes, the earth were an even and regular plain; a dreary ocean would then cover the whole globe, and it would be merely the habitation of the ſcaly race.

It cannot therefore to be ſuppoſed that even at firſt the ſurface of the earth was perfectly regular; and ſince its firſt production, a variety of cauſes, the motion of the waters, the ſubterraneous fires, the wind, and other external cauſes have contributed much to this irregularity.

Next to the elevation of mountains, the depths of the ocean form the greateſt irregularities; this depth is very different even at great diſtances from land; it is ſaid there are parts above a mile deep, but theſe are few, and the moſt general profundities are from 60 to 150 fathom. The gulphs bordering on the coaſts are much ſhallower, and the ſtraits have generally the leaſt depths.

In general, the depths in openſe as increaſe or diminiſh pretty regularly, being for the moſt part deeper the farther from land. But there are places in the middle of the ſea, as at the *Abrolkos* in the Atlantic, where large ſhelves appear; and in other places, there are vaſt ſand banks, to which the Eaſt India-men are no ſtrangers.

Along coaſts, the depths are alſo very irregular. Yet it may be laid down as a certain rule, that the depth is always proportioned to the height of the coaſt: The ſame remark is equally applicable to rivers.

The higheſt mountains in Aſia are Mount Taurus, Mount Imaus, Caucaſus, and the mountains of Japan, all of which are higher than any in Europe: the higheſt mountains in Africa, *i. e.* the great Atlas, and the mountains of the moon, are at leaſt as high as thoſe in Aſia, and the higheſt of all are in South America, particularly thoſe of Peru, which are more than 3000 fathoms higher than the level of the ſea. In general the mountains between the tropics are loftier than thoſe of the temperate zones, and theſe more than thoſe off the frigid zones, ſo that the nearer we approach the equator, the greater are the inequalities of the earth: theſe inequalities, although very inconſiderable with reſpect to us, are nothing when conſidered with reſpect to the terreſtrial globe. Three thouſand fathom difference to 3000 leagues diameter, is one fathom to a league, or one foot to 2300 feet, which on a globe of 2 feet and a half diameter, does not make the 6th part of a line. Hence this earth, which appears to us to be croſſed and cut by the enormous height of the mountains, and by the frightful depth of the ſea, is, when we conſider its ſize, ſo very ſlightly furrowed with irregularities, that they can make no variation upon its general figure.

Upon the continents the mountains are continued, and form chains. In iſlands they appear to be more interrupted and iſolated, and generally raiſed above the ſea, in form of a cone or pyramid, and are called *peaks*. The peak of Teneriffe is one of the higheſt mountains on the earth; it is near a mile and a half high perpendicular from the level of the ſea; the peak of St George in one of the Azores, and the peak of Adam in the iſland of Ceylon, are alſo exceedingly high. All theſe peaks are compoſed of rocks, piled one above another, which omit each from their ſummits, fire, cinders, bitumen, minerals, and ſtones. There are even iſlands which are preciſely only as tops of mountains, as the iſland of St Helena, Aſcenſion, moſt of the Azores, and Canaries; and we muſt remark, that in moſt of the iſlands, promontories, and other projecting lands in the ſea, the middle is always the higheſt, and they are generally ſeparated by chains of mountains, which divide them in their greateſt length, as the Grampian mountains in Scotland, which extend from eaſt to weſt, and divide Great Britain into two parts; it is the ſame with the iſlands Sumatra, Lucon, Borneo, Celebes, Cuba, and St Domingo, and alſo Italy, which is traverſed through its whole length by the Apenines.

With reſpect to the depths on the ſurface of the earth, thoſe of the ocean are, no doubt, the greateſt, but as theſe can only be diſcovered by ſounding, we ſhall take notice of none but ſuch as appear on the dry land. The precipices then which are between rocks, are formed by the ſinking of rocks, the baſe of which ſometimes gives way more on one ſide than the other, by the action of the air and froſt, which ſplits and divides them; and by the impetuous fall of torrents, which opens paſſages, and carries along with them whatever oppoſes their violence. But theſe abyſſes, that is, theſe vaſt and enormous precipices found at the ſummit of mountains, and to the bottom of which it is not poſſible ſometimes to deſcend, although they are above a mile or half a mile round, have been formed by the operation of fire. They were formerly the funnels of volcanoes, and all the matter which is there deficient, has been ejected by the action and exploſion of theſe fires, which are ſince extinguiſhed for want of combuſtible matter.

The abyſs of mount Ararat, of which M. Tournefort gives a deſcription in his voyage to the Levant, is ſurrounded with black and burnt rocks, as the abyſſes of Etna, Veſuvius, and other volcanoes will be, when they have conſumed all the combuſtible matters they include.

Plot, in his natural hiſtory of Staffordſhire, mentions a kind of gulph, which has been ſounded to the depth of 2600 perpendicular feet, without finding either water or bottom.

Great cavities and deep mines are generally in mountains, they never deſcend to a level with the plains; ſo we learn from them the internal ſtructure of the mountain only, and not that of the globe.

It was long thought that the chains of the higheſt mountains run from weſt to eaſt, till the contrary direction was diſcovered in the new world; but no perſon before Mr Bourguet diſcovered the ſurprizing regularity of the ſtructure of thoſe great maſſes. After having croſſed the Alps, thirty times in fourteen different parts, twice over the Apenine mountains, and made divers tours in the environs of theſe mountains, and in mount Jura, he found that the contours of all mountains bear a ſtriking reſemblance to the works of regular fortifications. When the body of the mountain runs from eaſt to weſt, it forms prominences, which face as much as poſſible the north and ſouth; this admirable irregularity is ſo ſtriking in vallies, that we ſeem to walk in a very regular covered way; if, for example, we travel in a valley from north to ſouth, we perceive that the mountain which is on the right forms projections or angles which front the eaſt, and thoſe of the mountain on the left front the weſt, ſo that, in fact, the prominent and concave angles, on each ſide, correſpond with one another alternately. The angles which mountains form in great vallies are leſs acute, becauſe the direction is leſs ſteep, and as they are farther diſtant from each other; and in plains they are not ſo perceptible as in the courſe of rivers, which generally take up their elbows; the middle of them naturally anſwer to the moſt ſtriking projections, or the moſt advanced angles of mountains; and this is the cauſe of the ſerpentine courſe of rivers. It is aſtoniſhing ſo obvious a fact ſhould have remained ſo long unobſerved, for when in a valley the inclination of one of the mountains which border it, is leſs ſteep than that of the other, the river takes its courſe much nearer the ſteepeſt mountain, and does not flow through the middle of the valley.

Theſe obſervations might be confirmed by a number of facts. The mountains of Switzerland, for inſtance, are ſteeper on the ſouth-ſide than on the north, and on the weſt than on the eaſt ſide. But the moſt ſtriking example is afforded by the mountains of Chili and Peru. The Cordeliers are exceedingly ſteep on the weſt ſide, but they have a gradual declivity towards the eaſt, and they terminate in vaſt plains, which are terminated by the largeſt rivers in the world.

This is a conſequence of the parallel direction of the different chains of mountains; and beſides the whole continent of Europe and of Aſia is broader from eaſt to weſt than from north to ſouth; for there are two modes of conceiving this direction. In the long and narrow continent of South America, there is only one principal chain of mountains, that is, from eaſt to weſt, or from weſt to eaſt; in fact, it is in this direction all the rivers of America flow, becauſe, excepting the Cordillieros, there are no very extenſive chains of mountains, and none whoſe directions are parallel to them. In the old as well as the new Continent, moſt of the waters have their greateſt extent from weſt to eaſt, and moſt of the rivers flow in this direction, which is owing to another cauſe, to wit, that there are many long chains of mountains parallel to each other, whoſe direction is from weſt to eaſt, and becauſe the rivers and other ſtreams are obliged to follow the intervals which divide theſe chains of mountains, conſequently one ſingle chain of mountains, directed from north to ſouth, will produce rivers, whoſe direction will be the ſame as that of thoſe which iſſued from many chains of mountains, whoſe common direction is from eaſt to weſt; and it is for this particular reaſon, that the rivers of America have this direction common with thoſe of Europe, Africa, and Aſia.

A remarkable phenomenon has been obſerved with reſpect to rivers, which is, that in the inland parts at a diſtance from the ſea, they flow in a direct line, but in proportion as they approach their mouths they aſſume more of a winding courſe. In large rivers there is a conſiderable eddy along the banks; and the nearer the ſea this eddy is the greater. The ſurface of the water in rivers is by no means level from bank to bank; on the contrary, the middle of the ſtream is higher or lower than the water of the ſides according to circumſtances. When a river ſwells ſuddenly by the melting of ſnow or any other cauſe, the middle of the ſtream is ſenſibly higher than the ſides: in one inſtance the elevation is ſaid to have been as great as three feet. On the other hand, when rivers approach their mouths, the water near the ſides is commonly more elevated than that in the middle.

The inundation of the Nile, though nothing can be more natural has long afforded matter for curious and doubtful ſpeculation. It is the rain which falls in Abyſſinia and Ethiopia which occaſions the ſwelling and inundation of this river, though the north wind muſt be regarded as the primitive cauſe. 1ſt, Becauſe it drives the clouds which convey this rain from the coaſt of Abyſſinia: 2ndly; becauſe blowing againſt the two mouths of the Nile, it forces the waters back againſt the ſtream, and thus prevents them from pouring into the ſea in too great a quantity: this circumſtance may every year be relied on, when the wind being at the north, and ſuddenly veering to the ſouth, the Nile in one day loſes what it gathered in four.

Inundations are generally greateſt in the ſuperior parts of rivers; becauſe the velocity of a river uniformly increaſes until it empties itſelf in the ocean. But as the theory of running waters is ſubject to many difficulties, we ought carefully to ſtudy the peculiarities of particular rivers.

The greateſt rivers of Europe are, the Wolga, whoſe courſe from Reſchow to Aſtracan on the Caſpian Sea, is about 650 leagues; the Danube, which runs about 450 leagues, from the mountains of Switzerland to the Black Sea; the Don, from the ſource of the Soſna, which receives it, to the Black Sea, runs 400 leagues; the Nieper, which alſo falls into the Black Sea, after running 350 leagues; the Duine, which empties itſelf in the White Sea, runs a courſe of about 300 leagues.

The greateſt rivers of Aſia are, the Hoanho, which riſes at Raja Rilron, and which, after running 850 leagues, falls into the middle of the gulf of Changi, in the Chineſe Sea; the Jeniſca, which runs from Lake Leling to the northern ſea of Tartary, a courſe of about 800 leagues; the Oby, from Lake Kila to the North Sea beyond Waigat's Straits, runs about 600 leagues; the Amour, in Eaſt Tartary, has a courſe of 575 leagues, from the head of the river Kerlon, which falls into it, to the ſea of Kamſchatka. The river Menan may be meaſured from the ſource of the Longmu, which falls into it, to its mouth at Poulo-condor; the Kian, which runs about 550 leagues, from the ſource of the Kinxa, which it receives till it diſcharges itſelf in the ſea of China; the Ganges, which has a courſe nearly of the ſame extent with the Kian; the Euphrates, computing from the ſource of the Irma, which it receives, runs about 500 leagues; the Indus, which runs about 400 leagues, and falls into the Arabian Sea on the eaſt of Guzarat; and the Sirderoias, which runs about 400 leagues, and falls into Lake Aral.

The greateſt rivers of Africa are, the Senegal, the courſe of which, comprehending the Niger, which is but a continuation of it. and the ſource of the Gambarou, which falls into the Niger, is about 1125 leagues; the Nile, which riſes in upper Ethiopia, runs about 970 leagues. There are others, the courſes of which are but little known, as the Zaira, the Coanza, the Couama, and the Quilmanci, but each of which we are acquainted with to the extent of 400 leagues.

In America, the river of the Amazons runs above 1200 leagues. The courſe of the river St Lawrence in Canada is more than 900 leagues. The river Miſſiſippi runs above 700 leagues. The Plata extends more than 800 leagues, from its mouth to the ſource of the Parana, which it receives. The Oronoko runs above 575 leagues, if we reckon from the ſource of the river Caketa, near Paſto, a part of which falls into the Oronoko, and a part runs towards the river of the Amazons. The Madera which falls into the Amazons extends above 660 leagues.

In order to aſcertain the quantity of water diſcharged into the ſea by all the rivers, we ſhall ſuppoſe the one half of the ſurface of the earth to be ſea, and the other half to be dry land. We ſhall alſo ſuppoſe that the mean depth of the ſea is 230 fathoms. The total ſurface of the earth is 170,981,012 ſquare miles, and that of the ſea is 85,490,506 ſquare miles, which when multiplied by one fourth, the depth of the ſea, gives 21,372,626 cubic miles for the quantity of water contained in the whole ocean. Now that we may pretty nearly aſcertain the quantity of water diſcharged into the ſea from the rivers, let us take the river Po, for example, which runs through Lombardy, and waters a country 380 miles long. According to Riccioli, the breadth of the Po is 100 feet, and its depth is 10 feet; and it runs at the rate of 4 miles in an hour. Conſequently, the Po diſcharges into the ſea 200,000 cubical perches of water in an hour; and as a cubic mile contains 125,000,000 cubic perches, the Po will require 26 days to diſcharge into the ſea, a cubic mile of water. It now only remains to determine the proportion that the Po bears to all the other rivers of the earth taken together, which cannot be done exactly. But, to come as near to the truth as poſſible, let us ſuppoſe the quantity of water, which the ſea receives from the great rivers in every country, to be proportioned to the extent of the ſurfaces of thoſe countries; and, conſequently, that the country watered by the Po, and by the rivers that fall into it, is to the total ſurface of the dry land, as the Po is to all the rivers of the earth. Now, from the moſt accurate charts, it appears, that the Po waters a country 380 miles long, and 120 broad, which makes 45600 ſquare miles. But the ſurface of the dry land is 85490506 ſquare miles; conſequently, the quantity of water conveyed to the ſea by all the rivers, will be 1874 times greater than the quantity diſcharged by the Po. But, as 26 rivers, equal to the Po, furniſh a cubic mile of water every day, it follows, that, in the ſpace of a year, 1874 rivers equal to the Po, will convey to the ſea 26308 cubic miles of water; and that in 812 years, all theſe rivers would diſcharge 21372626 cubic miles, which is a quantity equal to what is contained in the ocean; of courſe, if the ocean were empty, 812 years would be neceſſary to fill it from the rivers.

There reſults from this calculation, that the quantity of water evaporated from the ſea, and which the winds convey on the earth, producing rivulets, ſtreams, and rivers, is from 20 to 21 inches a year, or about two thirds of a line each day; this is a very trifling evaporation when even doubled or trebled, in order to eſtimate the water which falls back into the ſea, and which is not conveyed over the earth. Mr *Halley* has demonſtrated that the vapours which riſe above the ſea, and which the winds convey over the whole earth, are ſufficient to form all the rivers, and to contain all the waters which are on the ſurface of the earth.

In the old continent there are about 430 rivers, which fall directly into the ocean, or into the Mediterranean and Black Seas, and in the new continent, ſcarcely 180 rivers are known, which fall directly into the ſea. In this number however, I have included none but ſuch as are as large as the river Somme in Picardy. All theſe rivers carry to the ſea a great quantity of mineral and ſaline parts, which they have waſhed from the different ſoils through which they have paſſed. The particles of ſalt which are known to be eaſily diſſolved, are conveyed to the ſea by the water. Some naturaliſts, and among the reſt Halley, have pretended that the ſaltneſs of the ſea proceeded only from the ſalts of the earth, which the rivers tranſport thither. Others aſſert, that the ſaltneſs of the ſea is as ancient as the ſea itſelf, and that this ſalt was created only that it might not corrupt, but it may be well ſuppoſed that the ſea is preſerved from corruption by the agitations of the wind, and the flux and reflux, as much as by the ſalt it contains; for when it is kept in a barrel, it corrupts in a few days, and Boyle relates that a mariner becalmed for 13 days, found at the end of that time the ſea ſo infected, that if the calm had not ceaſed, the greateſt part of his people on board would have periſhed. The water of the ſea is alſo mixed with a bituminous oil, which gives it a diſagreeable taſte, and renders it very unhealthy. The quantity of ſalt contained in ſea water, is about 1-40th part, and the ſea is nearly equally ſaline throughout at top as at the bottom, under the line, and at the Cape of Good Hope, although there are ſeveral parts, as on the Moſambique Coaſt, where it is ſalter than elſewhere. It is alſo aſſerted not to be ſo ſaline under the Arctic Zone, which may proceed from the great quantity of ſnow, and the great rivers which fall into thoſe ſeas, and becauſe the heat of the ſun produces but little evaporation there, in compariſon of that produced in hot climates.

There are rivers which loſe themſelves in the ſands, and others which ſeem to precipitate into the bowels of the earth; the Guadalquiver in

Spain, the river of Gottenburg in Sweden, and the Rhine itſelf loſe themſelves in the earth. It is aſſerted, that in the weſt part of St Domingo, there is a mountain of a conſiderable height, at the foot of which are ſeveral large caverns that receive the rivers and brooks, whoſe fall is heard ſeven or eight leagues off. The rivers, however, which diſappear in the earth are very few; and they ſeem not to deſcend very deep. And it is probable that like the Rhine they loſe themſelves by dividing and diſappearing through a large ſurface of ſand, of which there are many examples in Africa, Perſia, Arabia, &c.

The rivers of the north carry down to the ſea prodigious quantities of ice, which form thoſe enormous maſſes ſo dangerous to the mariner. thoſe in the ſea of Nova Zembla and in the ſtraits of Waigat, come from the Oby, and, perhaps, from the Jeniſca, and other great rivers in Siberia and Tartary: thoſe of Hudſon's ſtraits, from Aſcenſion bay, into which many rivers in North America empty themſelves; and thoſe of Terra del Fuego, from the ſouthern continent. If fewer of them are found in the northern coaſts of Lapland than in thoſe of Siberia and Waigat's ſtraits, it is becauſe all the Lapland rivers fall into the gulf of Bothnia, and none of them into the North Sea.

The ocean ſurrounds the whole globe without any interruption of continuity, and the tour of the globe may be made by paſſing the point of South America, but it is not yet known whether the ocean ſurrounds the northern part of the globe in the like manner; and all mariners who have attempted to ſail from Europe to China by the north-eaſt or north-weſt, have equally miſcarried in their enterpriſes.

The ſeas which are called Mediterranean, are properly branches from the great ocean, by which they are ſupplied. Lakes differ from the Mediterranean ſeas, becauſe they do not receive any water from the ocean; for on the contrary, if they have communication with the ſeas, they furniſh them with water; thus the Black Sea, which ſome geographers have regarded as connected with the Mediterranean, and conſequently as an appendix of the ocean, is only a lake; becauſe, inſtead of receiving water from the Mediterranean, it ſupplies it with ſome, and flows with rapidity through the Boſphorus into the lake called the ſea of Marmora, and thence through the ſtrait of the Dardanelles into the Grecian ſea. The water of the Black Sea is leſs clear, and much leſs ſaline than that of the ocean. No iſland is to be met with in this ſea: tempeſts are very violent here, and more dangerous than in the ocean; becauſe the whole body of the waters being contained in a baſon, which may be ſaid to have no outlet, they have a kind of whirling motion, when they are agitated, which ſtrikes the veſſels on every ſide with an intolerable violence.

Next to the Black Sea, the greateſt lake in the univerſe is the Caſpian Sea, whoſe extent in length from north to ſouth is about 300 leagues, and ſcarcely more than fifty broad, computing it in a moderate proportion. This lake receives the Volga, which is one of the greateſt rivers in the world; and alſo ſome other conſiderable rivers, as the Keir, the Fay, and the Gempo; but what is ſingular, is, that it does not receive any on its eaſtern ſide throughout this whole length of 300 leagues. There are ſome ſmall iſlands in the Caſpian Sea, and its waters are much leſs ſaline than thoſe of the ocean. In this ſea no large veſſels are uſed, as navigation is very dangerous in it, becauſe it is ſhallow, and many banks and ſhoals are ſcattered under the ſurface of the water.

There are lakes which like pools, neither receive nor emit rivers. There are others which do receive rivers, and from which others run; and laſtly, ſome which only receive rivers. The Caſpian Sea and the lake Aral are of the laſt kind, they receive the waters of many rivers, and contain them. Thus the Dead Sea receives the Jordan, though no river iſſues from it. In Aſia Minor there is a ſmall lake of the ſame kind, which receives the waters of a river the ſource of which is near Congi, and which, like the preceding, has no other mode than evaporation, to throw off the waters it receives; there is one much larger in Perſia, on which the town of Marago ſtands, its figure is oval, and it is about ten or twelve leagues long, by ſix or ſeven broad; it receives the river Tauris, which is not very conſiderable. There is alſo a ſimilar ſmall lake in Greece, about 12 or 15 leagues from Lepanto, and there are ſome of the ſame ſort both in Africa and America.

The moſt general and largeſt lakes, however, are thoſe which having received another river, or many ſmall rivers, give riſe to other great rivers. It is worthy of remark that all lakes from which rivers derive their origin; all thoſe which fall into the courſe of rivers, and which carry their water to them, are not ſaline. But almoſt all thoſe, on the contrary, which receive rivers, without other rivers iſſuing from them, are ſaline, which ſeems to favour the opinion we have laid down on the ſubject of the ſaltneſs of the ſea, for evaporation cannot carry off fixed ſalts, and conſequently thoſe which rivers carry into the ſea remain in it; and although river water appears to taſte ſweet, we know that it contains a ſmall quantity of ſalt, and in courſe of time the ſea muſt have acquired a conſiderable degree of ſaltneſs, which muſt ſtill continue to increaſe. Hence, in my opinion the Black Sea, the Caſpian Sea, the lake Aral, the Dead Sea, &c. are become ſalt.

The lakes which are any ways remarkable, are, the Dead Sea, the waters of which contain much more bitumen than ſalt; this bitumen, which is called the *Bitumen of India*, is no other than the Aſphaltum, which has induced ſome authors to denominate this ſea, *Lake Aſphaltum*. The land which borders on this lake contains a great quantity of bitumen, and may have applied the fables to this lake, which the poets feign of the lake Avernus, that no fiſh could live in it, and that birds which attempted to fly over it were ſuffocated. But neither of theſe lakes produce ſuch mortal events; fiſh live in both, birds paſs over them, and men bathe in them without the leaſt danger. A petrifying lake in Iceland, is alſo mentioned, and the lake Neagh in Ireland, has alſo the ſame property of apparently turning wood, &c. into ſtone; but theſe petrifications are no other than incruſtations like thoſe made by the water of Arcueil.

CHAP.

CHAP III.

OF TIDES, OF WINDS, REGULAR AND IRREGULAR—MONSOONS—HURRICANES—WHIRLWINDS—WATER-SPOUTS.

WATER, like every other fluid, remains ſmooth and tranquil, unleſs put in motion by ſome foreign cauſe. All the waters of the ocean are collected in the loweſt places upon the ſurface of the earth; and hence the motion of the ſea muſt proceed from external cauſes. The chief motion is that of the tides, which riſe and fall alternately, and which produce a perpetual motion from eaſt to weſt. Theſe two motions have an unvariable relation to the motions of the moon. During the full and new moons, this motion from eaſt to weſt is moſt obſervable, as well as that of the tides, which ebb and flow upon moſt coaſts, every 6 ½ hours. It is always high tide when the moon arrives at the meridian; and it is always low tide, when the moon is at the greateſt diſtance from it. The motion from eaſt to weſt is perpetual; becauſe when the tide riſes, it puſhes an immenſe body of water from eaſt to weſt, and the ebbing ſeems only to be occaſioned by the ſmaller quantity of water which is then impelled weſtward.

This motion is attended with the following circumſtances: 1ſt, It is more apparent at the full and new moon than at the quadratures. It is alſo more violent in ſpring and autumn than in any other ſeaſon; and is weakeſt at the ſolſtices. This is owing to the combined attraction of the ſun and moon. 2d, The direction and quantity of this motion is often varied by the winds, particularly by thoſe which blow inceſſantly from the ſame quarter. 3d, It is worthy of remark, that when one part of a fluid is moved, the motion is communicated to the whole. During the tides, therefore, a great part of the ocean is put in motion; and, of conſequence, the whole ocean, from top to bottom is agitated at the ſame time.

In order to throw a little more light upon this ſubject, let us attend to the cauſes which produce the tides. We may therefore remark that the moon acts upon the earth by a power called gravity or attraction. This power penetrates the whole globe, and is exactly proportioned to the quantity of matter, and decreaſes as the ſquares of the diſtances increaſe. Let us now examine what effects this power muſt produce upon the waters when the moon comes to the meridian of any place. The ſurface of the water immediately under the moon is therefore nearer that planet than any other part of the earth, conſequently, that part of the ſea muſt be elevated toward the moon, and the ſummit of this eminence muſt be oppoſite to the moon's center. To produce this eminence the waters upon the ſurface, as well as thoſe at the bottom, contribute their ſhare, in proportion to their diſtances from the moon, which acts upon them in the invers ratio of the ſquares of their diſtances. Hence the ſurface of this part of the ſea is firſt elevated; the ſurface of the adjacent parts is alſo elevated, but not ſo much; and the waters at the bottom of all theſe parts are raiſed by the ſame cauſe. Thus as the whole portion of water under the moon is raiſed, the waters at a diſtance, upon which no attraction is exerted, muſt neceſſarily ruſh forward with precipitation to ſupply the place of thoſe which were drawn towards the moon. It is in this manner that the high tide is produced, which is more or leſs perceiveable in different coaſts, and which agitates the ſea not only at the ſurface, but at the greateſt depths. The ebb is a conſequence of the natural diſpoſition of the water, which when no longer acted upon by the moon, ſubſides, and returns to occupy thoſe ſhores from which it had been forced to retire by an external cauſe.

Nothing is more irregular in our climates than the courſe of the winds; but there are countries where this irregularity does not exiſt, and others where the wind blows conſtantly in the ſame direction.

There are ſeveral cauſes which influence the motions of the air, but the moſt powerful is the heat of the ſun, which by rarifying the air, produces an influx of the cold air, which is a heavier fluid, and conſequently preſſes in upon that which is rarified and light, and produces a ſtream or current of air. In the torrid zone this effect is more uniformly manifeſt than in other parts of the world. In the regions near the equinoctial line, a continual rarefaction is produced by the ſun, and a conſtant current of air follows that luminary in his progreſs from eaſt to weſt. This eaſterly wind blows ſo generally in the Pacific Ocean, that the ſhips which ſail from Acapulca to the Philippines, perform a voyage of 2700 leagues in leſs than two months.

About 28 or 30 degrees on this ſide of the line, the weſt winds are equally conſtant, and for this reaſon, the veſſels returning from the Weſt Indies to Europe do not purſue the ſame route as in going out.

The winds which blow continually for ſome months, are generally followed by contrary winds, and mariners are obliged to wait for that which is favourable to them; when theſe winds change, a calm or dangerous tempeſt enſues for ſeveral days, and ſometimes for a month.

Theſe general winds, occaſioned by the rarefaction of the atmoſphere, combine differently by different cauſes in different climates. In part of the Atlantic Sea, under the temperate zone, the north wind blows almoſt conſtantly during the months of October, November, December, and January, which is the reaſon why theſe months are the moſt favourable to embark from Europe to India, in order to paſs the line by the favour of theſe winds; and it is known, that ſhips which quit Europe in the month of March do not arrive ſooner at Brazil than thoſe which ſail in the month of October. The north wind almoſt continually reigns during winter in Nova Zembla, and the other northern coaſts. The ſouth wind blows during the month of July to Cape Verd, when the rainy ſeaſon, or winter of theſe climates ſets in: at the Cape of Good Hope the north weſt wind blows during the month of September: at Patna, in India, this north weſt wind blows during the months of November, December, and January, and produces heavy rains; but the eaſt wind blows during the other nine months.

In the kingdom of Guzarat, and on the coaſts of the neighbouring ſea, the north winds blow from March till September; and during the other months of the year ſouth winds almoſt always prevail. The Dutch, in order to return from Java, generally ſet ſail in the month of January or February by an eaſterly wind which is felt as far as 18 degrees northern latitude, after which they meet with ſouth winds which carry them to St Helena.

In the Mediterranean, the winds blow from the land towards the ſea at the ſun's ſetting, and, on the contrary, from the ſea towards the land at its riſing. Hence, in the morning it is an eaſterly wind, and in the evening a weſterly wind. The ſouth wind, which is rainy, and which generally blows at Paris, Burgandy and Champagne at the beginning of November, and which gives place to mild and temperate breezes, produces the fair weather vulgarly called the ſummer of St Martin's.

On the ſea, the winds are more regular than at land, becauſe the temperature of the ſea is more equal than that of the land. For the temperature of the latter is altered by a variety of cauſes; ſuch as electricity, volcanoes, exhalations from the earth, the exploſion of meteors, &c.

In general, on the ſea, the eaſt wind and thoſe which come from the poles, are ſtronger than the weſt and thoſe which proceed from the equators. On the land, on the contrary, the weſt and ſouth winds are more or leſs violent than the eaſt and north winds, according to the ſituation of the climates.

Contrary currents are often obſerved in the air; clouds that move in one direction, and others which are higher or lower than the firſt, proceed in a direction perfectly oppoſite. This contrariety of motion however does not remain very long, and it is commonly produced only by the reſiſtance of ſome clouds to the action of the wind, and by the reaction of the direct wind, which reigns ſolely as ſoon as the obſtacle is removed.

The winds are more violent in mountainous places than in plains; and the higher we aſcend, the more the power of the wind increaſes, until we reach the common height of the clouds, which is about one quarter or one third of a league perpendicular height. Beyond that height, the ſky is generally ſerene, eſpecially in ſummer, and the wind is ſaid to be even imperceptible on the tops of the higheſt mountains.

A current of air increaſes in velocity, like a current of water, where the ſpace of its paſſage is contracted. The wind which is but ſlightly felt in a wide and open plain, becomes violent in paſſing through a narrow paſſage between two mountains, or between two lofty buildings; and the point of the moſt violent action of the wind is above the ſtructures or mountain ſtraits. For the air being compreſſed by the reſiſtance of theſe obſtacles, has a greater maſs, denſity and the ſame velocity ſubſiſting; the effort or guſt of wind, the *momentum* becomes much ſtronger; this is the cauſe that near a church, or a caſtle, the winds ſeem to be much ſtronger than they are at a certain diſtance from theſe edifices. I have often remarked, that the wind reflected from a building that ſtands by itſelf, is ſtronger than the direct wind that produced it. And ſince I have endeavoured to diſcover the reaſon of this, I have been able to find no other than the above. The impelled air compreſſes againſt the building, and is reflected, not only with its former velocity, but alſo with a greater body, which, in fact, renders its action much more violent.

Particular winds, whether direct or reflected, are more violent than thoſe which are general. An uniformly continued ſtream of air produces not ſuch havock as the fury of thoſe winds which blow in ſudden guſts. The predominancy of certain winds, in certain parts, has occaſioned a general diviſion of them into zones, though it is not to be underſtood that their effects are invariable. The eaſt wind, which extends 20 or 30 degrees on each ſide of the equator, occupies the torrid zone, and the north wind the frigid zones. With regard to the temperate zones, the winds which reign there, are, if I may uſe the expreſſion, only currents of air, whoſe motion is compoſed of thoſe two winds whoſe direction tends to the weſt. And with reſpect to the weſterly winds, whoſe direction tends to the eaſt, and which often prevail in the temperate zone, whether in the Pacific or Atlantic oceans, they may be conſidered as winds reflected by the continents of Aſia and America, but originally derived from the eaſt and north winds.

The monſoons, or trade winds, which have an alternate motion, are ſubject to many deviations. Some continue for a longer, ſome for a ſhorter time; and they alſo differ in their extent, and in their degree of violence. In the Indian ocean, for inſtance, between Africa and India, as far as the Moluccas, the eaſt wind begins in January, and laſts till June. In the month of Auguſt or September, the contrary motion begins; and the weſt winds reign during three or four months. In the intervals of theſe monſoons, that is, at the end of June, in the month of July, and beginning of Auguſt, there is no wind on that ſea; but it is infeſted with violent ſtorms from the north.

There are winds which may be regarded as peculiar to certain coaſts; for example, the ſouth wind is almoſt continual on the coaſts of Chili and Peru. It begins about the 46th degree of ſouth latitude, and extends beyond Panama, which renders the voyage from Lima to Panama much eaſier performed than the return. The weſtern winds blow almoſt continually, or at leaſt very frequently, on the Magellanic coaſts, and over the environs of the ſtrait of Maire. The north and north-weſt winds prevail almoſt continually on the Malabar coaſt; the north-weſt wind is alſo very frequent on the coaſt of Guinea; and at a certain diſtance from that coaſt, in the open ſea, we meet with the north-eaſt wind very frequently. The weſterly winds reign on the coaſts of Japan, in the months of November and December.

The alternate or periodical winds, which we have juſt been ſpeaking of, are ſea winds. But there are alſo land winds, which are periodical, and return either at a certain ſeaſon, or in certain days, or even at certain hours. On the Malabar coaſt, for example, from the month of September to April a land wind blows from the eaſtern ſide: it generally commences at midnight and finiſhes at noon, and is not felt beyond 12 or 15 leagues from the coaſt, and from noon till midnight a weak ſea wind reigns, which comes from the weſt. On the coaſt of New Spain in America, and on that of Congo in Africa, land winds reign during the night, and ſea winds during the day. At Jamaica the winds blow from all quarters at once during the night, which hinders veſſels from either landing or ſetting out but in the day time.

The winds are however more irregular on the land than on the ſea, and more irregular in the higher lands than in plains. The mountains not only alter the direction of winds, but they even produce winds, which are either conſtant or variable according to different cauſes. The melting of the ſnow, which is upon the mountains, generally produces conſtant winds, which ſometimes remain very long. The vapours which are ſtopt by mountains, and which accumulate upon them, produce variable winds, very frequent in all climates.

mates. In the ſtraits, on all the projecting coaſts, at the extremity and in the environs of all promontories, peninſulas and capes, and in all narrow gulphs, ſtorms are frequent. But independent of theſe circumſtances ſome ſeas are much more tempeſtuous than others. The Indian ocean, the Japan Sea, the Magellanic Sea, that of the African coaſt beyond the Canaries, and on the other ſide towards the country of Natolia, the Red Sea, &c. are very ſubject to ſtorms. The Atlantic ocean is more ſtormy than the ocean, which, from its tranquillity, is called the *Pacific*. This ocean, however, is not abſolutely tranquil, except between the tropics, and about the temperate zones; and the more we approach the poles, the more we are ſubject to variable winds, whoſe ſudden change often occaſions tempeſts.

All continents are ſubject to variable winds, which often produce ſingular effects. In the kingdom of Caſſimir, which is ſurrounded by the mountains of Caucaſus, a very ſudden reverſe of ſeaſons is felt on mount Pirepenjale. In leſs than an hour's journey on it we paſs from ſummer to winter. A north and a ſouth wind, according to Bernier, blow perceptibly within 200 paces of one another. In the peninſula of India, which is traverſed from north to ſouth by the mountains of Gate, the extreme heats of ſummer are felt on one ſide of the mountains, and all the rigours of winter on the other. The ſame phenomenon is alſo obſerved at Cape Rozalgate in Arabia, and on the iſland of Ceylon.

In Egypt during ſummer, a ſouth wind prevails which is ſo hot as to ſtop reſpiration; and it raiſes ſo great a quantity of ſand, that the ſky ſeems covered with thick clouds. This ſand is ſo fine, and driven with ſuch force, that it penetrates every where, even into the cloſeſt coffers. When theſe winds laſt ſeveral days they occaſion epidemical diſeaſes, which are often attended with the moſt fatal conſequences.

The Cape of Good Hope is famous for its tempeſts, and the ſingular cloud which produces them. This cloud appears at firſt only like a ſmall round ſpot in the heavens, called by the ſailors *the Ox's Eye*, and which I imagine appears ſo little from its exceeding great height. In Natolia, a cloud ſimilar to the Ox's eye at the Cape, produces the ſame direful effects. In the ſea between Africa and America, eſpecially under the equator and in the neighbouring parts of it, theſe tempeſts very often ariſe; near the coaſt of Guinea ſome times three or four of theſe ſtorms are formed in a day. They are occaſioned and announced, like thoſe of the Cape, by ſmall black clouds. The reſt of the ſky is generally very ſerene, and the ſea calm. The firſt blaſt which iſſues from theſe clouds is furious, and would ſink ſhips in open ſeas, if they did not take the precaution to furl the ſails. It is principally in the months of April, May and June that theſe tempeſts are experienced on the Guinea ſea, becauſe no regular wind blows there during the ſeaſon.

All theſe tempeſts originate from winds which iſſue from a cloud, and their direction, is either to the north or ſouth, north eaſt or ſouth weſt, &c. But there are tempeſts called *hurricanes*, which are ſtill more violent, and in which the winds ſeem to blow from all the coaſts at once, with a circular motion, which nothing can reſiſt. A calm generally precedes theſe horrible tempeſts; but in an inſtant the fury of the winds raiſes waves as high as the clouds. Some parts of the ſea cannot be approached, becauſe they are continually infeſted with calms or whirlwinds. The Spaniards have therefore called theſe places *calms and tarnados*.

When from a ſudden rarefaction, or any other cauſe, contrary currents of air meet in the ſame ſpot, a whirlwind is produced. Perhaps the ſame effect takes place in another element, and gulphs or whirlpools may be no other than the eddies of the water formed by the action of two or more oppoſite currents. The Euripus, ſo famous for the death of Ariſtotle, alternately abſorbs and rejects the water ſeven times in twenty-four hours. This gulph is near the Grecian coaſt. The Charybdis, which is near the ſtrait of Sicily, rejects and abſorbs the water thrice in twenty four hours. We are uncertain, however, with reſpect to the number of alternate motions in other whirlpools. The greateſt known gulph is that of the Norway Sea, which is affirmed to be upwards of twenty leagues in circuit. It abſorbs for ſix hours water, whales, ſhips, and whatever is near it, and afterwards returns them in ſix hours.

A waterſpout is no other than a whirlwind at ſea. The vacuum which is occaſioned by the meeting currents makes the waters riſe up in the form of a cylinder, or rather of an inverted cone. In the travels of Mr Thevenot there is a very minute and circumſtantial account of the formation of a waterſpout, though there is reaſon to ſuſpect that the relation is not without ſome optical deceptions.

The firſt, ſays this celebrated voyager, that we ſaw, was on the northern coaſt, between us and the iſland Queſomo, about a gun-ſhot from the ſhip. We directly perceived water which boiled on the ſurface of the ſea about a foot high; it was whitiſh, and appeared above that height like a thick black ſmoke, ſo that it properly reſembled ſome burning ſtraw, which only ſmoked. It made a noiſe like that of a torrent which runs with much rapidity in a deep valley. But this noiſe was mixed with another, ſimilar to the ſtrong hiſſing of ſerpents or vipers. A little while afterwards we perceived ſomething like a dark canal, or pipe, which bore a ſtrong reſemblance to ſmoke which aſcends towards the clouds, revolved with great velocity. This pipe appeared to be about the thickneſs of my finger, and the ſame noiſe continued. The duration of this ſpout was about a quarter of an hour. We then perceived another on the ſouth ſide of us, which began in the ſame manner as the preceding. Immediately a third and then a fourth ſprung up, both to the weſt. Each of them appeared like heaps of ſmoking ſtraw, and were accompanied with the ſame noiſe as the firſt. We afterwards ſaw three pipes or canals, which deſcended from the clouds, on thoſe places where the water was raiſed up, and each of them was as broad at the end faſtened to the cloud, as the broad end of a trumpet, and reſembled the teat of an animal, drawn perpendicularly down by an heavy weight. Theſe canals appeared of a darkiſh white, and were not ſtrait, but crooked in ſome places. They even were not perpendicular; but on the contrary, from the clouds where they were joined to the parts, which drew in the water, they were very much bent. And what is ſingular, is, that the cloud which the ſecond of theſe three was faſtened to, having been driven by the wind, this canal followed it without breaking or quitting the place where it drew in the water, and paſſing behind the firſt canal, they were ſometimes croſſed like a St Andrew's

Croſs. At the beginning they were all three about the thickneſs of my finger, but afterwards the firſt of the three increaſed conſiderably. But the laſt which was formed ſcarcely remained longer than that which we ſaw on the north ſide. The ſecond on the ſouth ſide remained about a quarter of an hour, but the firſt on that ſide remained a little longer, and it was this which terrified us the moſt. At firſt its canal was as thick as my finger, afterwards as thick as my arm, then as my leg, and at laſt as the trunk of a large tree, which a man might compaſs with his arms. We diſtinctly perceived water through this tranſparent body which aſcended in a ſerpentine form. Sometimes it diminiſhed a little in ſize, ſometimes at top and ſometimes at bottom, then it reſembled exactly a ſoft tube with ſome fluid matter preſſed with the fingers, either upwards, to make this liquor deſcend, or at bottom to make it aſcend. After this it diminiſhed ſo much that it was thinner than my arm; afterwards it returned as thick as my thigh, and then again became very thin. At laſt, I ſaw that the water elevated on the ſurface of the ſea began to lower, and that the end of the canal which touched it divided and grew narrower, when a variation of the light removed it from our view.

CHAP IV.

OF VOLCANOES—EARTHQUAKES—THE FORMATION OF NEW ISLANDS—CAVERNS AND GROTTOES—BOGS AND FENS—CHANGES OF LAND INTO SEA, &c.

THE burning mountains called volcanoes, include in their bowels ſulphur, bitumen, and other materials which ſerve as aliment to a ſubterraneous fire, the effect of which is more violent than that of gunpowder or even of thunder. A volcano is a cannon of a very large ſize, the orifice of which is often more than half a league. This mouth vomits forth torrents of ſmoke, flame, rivers of bitumen, ſulphur, and melted metal, clouds of cinders and ſtones, and ſometimes it ejects enormous rocks to many leagues diſtance, which would baffle the utmoſt efforts of human ſtrength. The combuſtion is ſo terrible, and the quantity of burnt, melted, calcined, and vitrified materials which the mountain throws out, is ſo plentiful, that they enter cities, foreſts, cover the fields an hundred and two hundred feet in thickneſs, and form ſometimes hills and mountains. The action of this fire is ſo great, the force of exploſion ſo violent, that its reaction has been known to ſhake the earth, agitate the ſea, overthrow mountains, and deſtroy the moſt ſolid towns and edifices, even to very conſiderable diſtances. The natives of Iceland imagine that the roarings of the volcano are the cries of the damned, and its eruptions the effects of the rage and deſpair of theſe unhappy wretches.

All theſe phænomena, however, are only the effects of fire and of ſmoke. In the bowels of mountains, there are veins of ſulphur, bitumen and other inflammable ſubſtances, and alſo great quantities of pyrites,
which

which ferment when expoſed to the air, or to moiſture, and produce exploſions in proportion to the quantity of inflammable matter they contain. A mixture of ſulphur, of filings of iron, and of water, buried at a certain depth below the ground, will exhibit, in miniature, all the appearances of a volcano. This mixture will ſoon produce exploſions perfectly ſimilar to thoſe of burning mountains.

There are three famous volcanoes in Europe, mount Ætna in Sicily, mount Hecla in Iceland, and mount Veſuvius in Italy near Naples. Mount Ætna has burnt from time immemorial. Its eruptions are very violent, and the matters it throws out are ſo plentiful, that they may be dug to the depth of 68 feet, where we meet with marble pavement, and the veſtiges of an ancient town which has been covered and buried under this thickneſs of matter ejected from the mount, in the ſame manner as the city of Herculaneum has been covered by the matter thrown out from Veſuvius. New mouths of fire were formed in 1650, 1669, and at other times. We ſee the flame and ſmoke of this volcano from Malta, which is about 60 leagues diſtant from it; it ſmokes continually, and it ſometimes vomits flames and matters of every kind with impetuoſity. In 1537, there was an eruption of this volcano, which occaſioned an earthquake in Sicily for 12 days, and which overthrew a very great number of houſes and ſtructures. It ceaſed only by the opening of a new fire mouth, which burnt every thing for five miles in the environs of the mountain. The cinders thrown out by the volcano were ſo abundant, and ejected with ſo much force, that they were driven as far as Italy; and veſſels which were departed to ſome diſtance from Sicily, were incommoded by them. Farelli deſcribes the conflagration of this mountain circumſtantially, and ſays the foot of it is 100 leagues in circumference.

This volcano has now two principal mouths, the one narrower than the other. Theſe two vents always ſmoke, but fire is never ſeen to iſſue from it, but during the time of eruptions. It is pretended that ſtones are found which it has thrown out to the diſtance of 60,000 feet*.

One of the laſt and moſt violent eruptions of mount Veſuvius was in in the year 1737. The mountain vomited by divers mouths large torrents of burning metallic matters, which diſperſed themſelves over the country and into the ſea. Monſ. de Montealegre, who communicated this relation to the Academy of Sciences, obſerved with horror one of theſe rivers of fire, and ſaw its courſe for ſix or ſeven miles till it reached the ſea. Its breadth was ſixty or ſeventy feet, its depth, twenty-five or thirty palms, and in certain bottoms or valleys, 220: the matter which flowed was like the ſcum which iſſues from the furnace of a forge.

In Aſia as well as in America there are a great number of volcanoes; but there is nothing peculiarly worthy of remark in any, except the violence with which ſome of them occaſionally emit the burning matters with which they are charged.

Near Fez in Africa, there is a mountain, or rather a cavern called *Beniguazevel*, which always emits ſmoke, and ſometimes flames. One of the iſlands of Cape Verd, called the iſland of *Fuego*, is only a large mountain which burns inceſſantly. This volcano, like the reſt, throws out many cinders and ſtones; and the Portugueſe who have attempted ſeveral times to erect habitations in this iſland, have been conſtrained to abandon this project, through the dread of the effects of the volcano. The Canaries, the Peak of Teneriff, and ſome of the higheſt mountains in the world, throw out fire, cinders, and large ſtones; from the top rivulets of melted ſulphur flow, which are diſtinguiſhable at a great diſtance.

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* See a moſt intereſting deſcription of this celebrated mountain in an elegant and entertaning production publiſhed by R. Moriſon and Son, intitled, "Brydone's Tour through Sicily and Malta."

The matters which volcanoes throw out, generally come forth in the form of a torrent of melted minerals, which inundates all the environs of theſe mountains. Theſe rivers of liquified matters extend even to conſiderable diſtances, and when cooled, form horizontal or inclined ſtrata, which for poſition are like the ſtrata formed by the ſediment left by the waters. But it is very eaſy to diſtinguiſh the ſtrata produced by the expanſion of matters thrown out by volcanoes, from thoſe which have the ſediment of the ſea for their origin. 1. Becauſe theſe ſtrata are not of an equal thickneſs: 2. Becauſe they contain only matters which are eaſily perceived to have been calcined, vitrified, or melted, and becauſe they do not extend to any great diſtance. When coal mines are opened, which are generally met with in argillaceous earth at a great depth, it ſometimes happens that theſe matters have taken fire. There are even mines of coal in Scotland, Flanders, &c. which have burnt for a number of years. The communication of the air ſuffices to produce this effect, but the fires which are lighted in theſe mines, produce only ſlight exploſions, and do not form volcanoes, becauſe all being ſolid and full in theſe places, fire cannot be excited, like that of volcanoes, in which there are cavities and void places where the air penetrates, which muſt neceſſarily extend the conflagration and augment the action of the fire, to the point in which we ſee it when it produces the terrible effects we have taken notice of.

There are two kinds of earthquakes, the one occaſioned by the action of ſubterraneous fires, and the exploſion of volcanoes, which are only felt at ſmall diſtances, and at the time when volcanoes act, or before they open. When the matters which form ſubterraneous fires, ferment, heat and inflame, the fire makes an effort on every ſide, and if it does not find a natural vent, it raiſes the earth and forces a paſſage for itſelf by throwing it out, which produces a volcano, whoſe effects are repeated, and laſt in proportion to the quantity of inflammable matters. If the quantity of matters which take fire, is not conſiderable, a commotion or an earthquake may enſue, without a volcano being formed. The air produced and rarefied by the ſubterraneous fire, may alſo find ſmall vents, by which it will eſcape, and in this caſe there will be only a ſhock without any eruption or volcano. But when the inflamed matter is in a great quantity, and confined by ſolid and compreſſed matters, then a commotion and volcano ariſes; but all theſe commotions form only the firſt kind of earthquakes, and can only ſhake a ſmall ſpace of ground. A very violent eruption of mount Ætna will occaſion, for example, an earthquake through the whole iſland of Sicily; but it will never extend to the diſtance of three or four hundred leagues. When any new mouths are formed in mount Veſuvius, there are earthquakes at Naples and in the neighbourhood of the volcano: but theſe earthquakes have never ſhook the Alps, and are not communicated to France or to other countries remote from the ſource of the phenomenon.

But there is another kind of earthquake, very different in its effects, and perhaps in its cauſes. There are earthquakes too which are felt at great diſtances, and which ſhake a long courſe of ground, without any new volcano or eruption appearing.

To underſtand rightly what may be the cauſes of this kind of earthquake, it muſt be remembered, that all inflammable matters capable of exploſion, produce, like gun powder, by inflammation, a great quantity of air; that this air produced by fire is in a ſtate of very great rarefaction; and that, by a ſtate of compreſſion in which it is found in the bowels of the earth, it muſt produce very violent effects. Let us therefore ſuppoſe, that, at a very conſiderable depth, as at about one or two hundred fathoms, pyrites, and other ſulphureous matters are to be met with; and that, by the fermentation produced by the filtration of the water, or other cauſes, they inflame. At firſt, theſe matters are not diſpoſed regularly by horizontal ſtrata, as the more ancient matters are, which have been formed by the ſediment of the waters. On the contrary, they are formed in perpendicular ſtrata, in caverns at the foot of theſe clefts, and in other parts where the water can act and penetrate. Theſe matters inflaming, will produce a great quantity of air or vapour, the ſpring of which, compreſſed in a ſmall ſpace, like that of a cavern, will not ſhake the earth immediately above, but will ſearch for paſſages, in order to make its eſcape. It will therefore naturally force its way through thoſe parts where it meets leaſt obſtruction, and will therefore proceed through the interſtices between the different ſtrata, or through any channel or caverns through which it can find a paſſage. This ſubterraneous air or vapour will therefore produce in its paſſage a noiſe and motion proportioned to its force and to the reſiſtance it meets with. And theſe effects will continue till it finds a vent, perhaps in the ſea, or till it has diminiſhed its force by being greatly expanded. This explanation correſponds entirely with all the phenomena which are obſerved reſpecting earthquakes. They proceed with a wave-like motion, and are felt at different places, not at the ſame inſtant, but at different times, in proportion to the diſtance.

We can alſo confirm what has been advanced, by connecting it with two other circumſtances. It is well known that mines exhale vapours, independent of the wind produced by the current of the water; we often ſee currents of unhealthy air and ſuffocating vapours. We alſo know that there are holes, abyſſes and deep lakes in the earth, which produce winds, like the lake Boleſlaw in Bohemia, &c.

From hiſtory we have innumerable inſtances of the dreadful and various effects of theſe terrible phenomena. Pliny, in his firſt book, chap. 84, relates, that in the reign of Tiberius, an earthquake happened, which overthrew twelve towns in Aſia; and in his ſecond book he mentions, an earthquake, which overthrew 100 towns in Lybia. In the time of Trajan, the town of Antiochus, and a great part of the adjacent country, were ſwallowed up by an earthquake; and, in the time of Juſtinian, in 528, it was again deſtroyed by a ſecond, with upwards of 40,000 of its inhabitants. And, ſixty years after, in the time of Saint Gregory, it felt the effects of a third earthquake, with the loſs of 60,000 of its inhabitants. In the time of Saladin, in 1182, moſt of the towns of Syria and Jeruſalem were deſtroyed by the ſame cauſe. In Calabria and Poh, there have been more of them than in any other part of Europe. In the time of Pope Pius XI. all the churches and palaces of Naples were overthrown, and above 30,000 of its inhabitants killed. In 1629, there were earthquakes in Pola, which deſtroyed 7000 perſons; and in 1638, the town of Saint Euphemia was ſwallowed up; and there remains only a ſtinking lake in its place. Raguſa and Smyrna were alſo almoſt deſtroyed. There was an earthquake in 1692, which extended into England, Holland, Flanders, Germany and France; it was chiefly felt on the ſea coaſts and rivers, and extended to a ſpace of at leaſt 2600 leagues ſquare. On the 16th of June, 1628, there was ſo horrible an earthquake in the iſland of St Michael, that the ſea near it opened, and, in one place where it was more than 150 fathoms deep, threw up an iſland more than a league and a half long, and upwards of 60 fathoms high.

Another earthquake happened in 1691, which began the 16th of July, and laſted in the iſland of St Michael till the 12th of the following month. Tercera and Fayal were agitated the next morning with ſo much violence, that they appeared to move; but theſe frightful ſhocks returned only four times; whereas, at St Michael's, they did not ceaſe a moment for 15 hours. The iſlanders having quitted their houſes, which they ſaw fall before their eyes, paſſed all that time expoſed to the injuries of the weather. A whole town, named Villa Franca, was overthrown to its very foundation, and moſt of the inhabitants buried under its ruins. Several plains roſe into hills; and ſome mountains became flat. A ſpring of water iſſued from the earth, which flowed for four hours, and which appeared dry all on a ſudden. The air and ſea, ſtill more agitated, reſounded with a noiſe like the roaring of a quantity of wild beaſts. Many perſons died with the fright, and the ſhips in the ports ſuffered dangerous ſhocks; and thoſe which were at anchor or under ſail, 20 leagues diſtant from the iſlands, ſuſtained great damage.

In the year 1646, the mountain of the iſland of Machian ſplit with terrible reports, by an earthquake; and ſo many fires iſſued through this opening, that they conſumed many negro-yards, and all that was in them. This prodigious crack is ſtill apparent; and it is called the path of Machian, becauſe it deſcends from the bottom like a road hollowed out, but which at a diſtance appears like a path.

At ſea the ſhock of an earthquake is felt at a conſiderable diſtance. M. Shaw relates, that, in 1721, being on board the Gazelle, an Algerine veſſel, mounting 50 guns, three violent ſhocks were felt one after the other, as if every time a weight of 20 or 30 tons had been thrown on the ſhip. This happened in a part of the Mediterranean which was 200 fathoms deep.

In countries ſubject to earthquakes, it happens, when a new volcano is formed, earthquakes ceaſe, and are only felt in the violent eruptions of the volcano, as is obſerved in the iſland of St Chriſtopher.

New iſlands are produced, either ſuddenly by the operation of ſubterraneous fires, or ſlowly by the accumulated ſediments of water. Seneca informs us, that, in his time, the iſland Theraſia ſuddenly emerged from the ſea; and Pliny relates, that thirteen iſlands aroſe all at once from the bottom of the Mediterranean. Upon this ſubject, however, we have ſome facts more recent, and leſs involved in obſcurity.

The 23d of May, 1707, at ſun riſing, near this ſame iſland of Theraſia, or Santorini, ſomething was ſeen like a floating rock in the ſea. Some perſons excited by curioſity, approached it, and found this ſhoal, which had iſſued from the bottom of the ſea, to increaſe under their feet; and they brought with them the pumice ſtone and oyſters, which the rock ſtill had attached to its ſurface. There was a ſlight earthquake at Santorini, two days before the growth of this ſhoal. This new iſland increaſed conſiderably till the 14th of June, without any accident, and was then half a mile round, and from twenty to thirty feet high. The earth was white, and bordered a little on argillaceous, after which the ſea was ſtill more agitated; vapours aroſe, which infected the iſland Santorini; and, the 16th, 17th, or 18th of July, rocks were ſeen to iſſue at one time from the bottom of the ſea; all of which ſeemed to unite into one rock. All this was done with a diſmal noiſe, which continued upwards of two months, with flames that roſe from the new iſland, which ſtill kept itſelf increaſing in circumference and height; and the exploſions always threw out rocks and ſtones to the diſtance of ſeven miles.

The 10th of October, 1720, near the iſland Tercera, a very conſiderable fire aroſe out of the ſea. Mariners having been ſent to examine it, they perceived, the 19th of the ſame month, an iſland which appeared to be covered with fire and ſmoke, and a prodigious quantity of cinders thrown to a diſtance, as from a volcano, and accompanied with a noiſe ſimilar to that of thunder.

The hiſtorian of the French Academy in relating this event, remarks, that, after an earthquake in the iſland of St Michael, a torrent of fire appeared between it and the iſland Tercera, which gave birth to two new rocks. And, next year, the ſame hiſtorian gives the following account:

" M. de l'Iſle has informed the Academy of ſeveral particulars, " which were communicated to him in a letter, from M. de Montagnac, " conſul at Liſbon, concerning the new iſland among the Azores. " On the 18th of September, 1721, M. de Montagnac's veſſel was " moored off the Fortreſs of St Michael; and he procured from the " Pilot of the port the following intelligence.

" On the 7th of December, 1720, at night, a great earthquake " happened in Tercera and St Michael, which are diſtant about 28 " leagues from one another, and a new iſland emerged from the ſea. " It was, at the ſame time, obſerved that the iſland Peak, thirty leagues " diſtant, which ejected flames, was extinguiſhed. But a continual " thick ſmoke proceeded from the new iſland, which was diſtinctly per- " ceived by M. de Montagnac, as long as he ſtaid in that part. The " pilot aſſured him, that he had ſailed round the iſland, and approach- " ed it as near as he could with ſafety. He ſounded on the ſouth ſide " of it with a rope of 60 fathoms; but found no bottom. On the weſt " ſide, the water appeared to be mixed with white, blue and green; " and at the diſtance of two miles, it ſeemed to be ſhallow and boiling. " On the north-weſt, the ſide from which the ſmoke iſſued, he found, " at 15 fathoms, a bottom of coarſe ſand. He threw a ſtone into the " ſea, and at the place where it fell, he obſerved the water boil and

" mount into the air with great velocity. The bottom was ſo hot as
" to melt a piece of ſuet that had been faſtened to the end of the
" plumb line. The pilot alſo obſerved ſmoke to iſſue from a ſmall lake,
" in the midſt of a ſandy plain.

" We have ſince learned from M. Adrien, the French conſul at St
" Michael, dated, March 1722, that the new iſland is near on a level
" with the water; and that it will probably ſoon diſappear.

" From theſe and ſeveral other ſimilar facts, it appears, that in-
" flammable bodies exiſt under the bottom of the ſea, and that they
" ſometimes produce violent exploſions."

On the whole, however, the iſlands produced by the action of fire and earthquakes, are but few, and theſe events are ſeldom; but there are an infinite number of new iſlands produced by the mud, ſand and earth, which the rivers, or the ſea carry and tranſport into different places. At the mouth of all rivers, maſſes of earth and banks of ſand are formed, whoſe extent often become conſiderable enough to form iſlands of a moderate ſize. The ſea retiring from certain coaſts, leaves the parts higheſt from the bottom naked, which form ſo many new iſlands. And likewiſe, by extending itſelf on certain ſhores, it covers the loweſt parts, and leaves the higheſt, which it could not ſurmount, to appear above the ſurface of the water, which form ſo many more iſlands. In conſequence of which, it is remarked, that there are very few iſlands in the middle of the ſea, and that they are almoſt all in the neighbourhood of the continents, where the ſea formed them, either by retreating from, or approaching towards, theſe different countries.

Water and fire, whoſe natures are different, and even contrary, produce what, at leaſt appears to us to be ſimilar effects. Water, as has been obſerved, has produced mountains, and formed moſt iſlands. There are likewiſe caverns, clefts, holes, gulphs, &c. ſome of which owe their origin to ſubterranean fires, and others to water.

Saint Patrick's cavern, in Ireland, is not ſo conſiderable as it is famous. It is the ſame with the Dog's Grotto in Italy, and with that which throws out fire in the mountain of Benigauzeval, in the kingdom of Fez.

One of the moſt remarkable and largeſt caverns known, is that of Antiparos, which is computed to be three hundred fathoms deep from the ſurface of the earth; but the grotto appears to be forty fathoms high by fifty broad. It is filled with large, beautiful ſtalactites, of various forms, both on the root of the vault and at the bottom.

In that part of Greece, called Livadia, (the Achaia of the ancients) there is a large cavern, in a mountain which was formerly very famous for the oracles of Trophonius, between the lake Livadia and the adjacent ſea. There are forty ſubterranean paſſages acroſs the rock, under a lofty mountain, through which the waters of the lake continually flow.

In the month of June, 1714, a part of the mountain of Diableret in Valois, fell ſuddenly, between two and three o'clock in the afternoon. The ſky was very ſerene; the mountain was of a conical figure, and deſtroyed fifty-three huts belonging to the boors, and cruſhed to death fifteen people, and above two hundred cattle, and covered a ſquare league with its ruins. A profound darkneſs was occaſioned by the duſt. The heaps of ſtones thrown together ſtopped the current of the water, which formed new and very deep lakes. In all of which, however, there was not the leaſt trace of bituminous matter, ſulphur, lime, nor conſequently any ſubterranean fire, and it appeared that the baſe of this great rock was worn away, or reduced to duſt*.

We have a remarkable example of theſe ſinkings near Folkſtone, in the county of Kent. The hills in its environs have ſunk gradually, by an imperceptible motion, and without any earthquake. Theſe hills internally are rocks of ſtone and chalk. By this ſinking, they have thrown into the ſea rocks and earths which are adjacent to it.

When the waters on the ſurface of the earth cannot find vent to flow, they form moraſſes and bogs. The moſt famous moraſſes in Europe, are thoſe of Muſcovy at the ſource of Tanais; thoſe of Finland, where are the great moraſſes of Savolax and Enaſak. There are alſo ſome in Holland, Weſtphalia, and many other low countries. In Aſia, the moraſſes of the Euphrates, thoſe of Tartary, and the Palus Meotidis; nevertheleſs, in general, there are fewer of them in Aſia and Africa than in Europe. But America may be ſaid to be but one continued moraſs, through all its plains. This great number of moraſſes is a proof of the modern date of the country, and of the ſmall number of inhabitants, and ſtill more of their want of induſtry.

To give an idea of the quantity of earth which the rain detaches from the mountains and carries along with it into the valleys, we can quote a circumſtance related by Dr Plot. In his Natural Hiſtory of Staffordſhire, he obſerves that, eighteen feet deep in the earth ſeveral pieces of money coined in the reign of Edward V. have been found; i. e. two hundred years before his time. Hence this ground, which is boggy, has increaſed above a foot in eleven years, or an inch and a twelfth every year. We can ſtill make a ſimilar obſervation on trees buried at ſeventeen feet depth, below which medals of Julius Cæſar have been found. Thus the earth brought from the tops of mountains into plains by running waters, fail not to increaſe the elevation of the ground of plains very conſiderably.

In the city of Modena, and four miles round, whatever part is dug, when we reach the depth of ſixty-three feet, and bore five feet deeper with an auger, the water ſprings out with ſuch force, that the well is filled in a very ſhort ſpace of time. This water flows continually, and neither diminiſhes nor increaſes by the rain or drought. What is remarkable in this ground, is, that when we reach the depth of fourteen feet, we find pavements, and other ruins of an ancient town, as boards, houſes, different pieces of moſaic work, &c. Below theſe we find a very ſolid ground, which is thought to have never been ſtirred; yet below it we find a moiſt earth mixed with vegetables. And at twenty-ſix feet, are entire trees, as nut-trees, with nuts on them, and a great quantity of branches and leaves of trees. At twenty-eight feet depth, we meet with a friable chalk, mixed with many ſhells; and this bed is eleven feet in thickneſs; after which, we again meet with vegetables, and ſo on alternately chalk and earth mixed with vegetables, to the depth of ſixty-three feet. At which depth is a bed of ſand mixed with ſome gravel and ſhell, like thoſe formed on the coaſts of the Italian ſea. Theſe ſucceſſive beds of fenuy or marſhy earth and chalk, are always found in the ſame order, wherever we dig; and very often the auger meets with large trunks of trees, which it bores through, but which give great trouble to the workmen; bones, coals, flint and pieces of iron are alſo found. Ramazzini, who relates theſe circumſtances, thinks that the gulph of Venice formerly extended beyond Modena; and that perhaps by the inundations of the ſea, this ground has been formed.

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* Hiſtoire de l' Academie des Sciences, anno 1715, p. 4.

It is evident, that conſiderable changes have taken place on the ſurface of the globe not only by the action of fire, but alſo by water. The ſea, from various circumſtances, has repeatedly changed its bed. Authors have ſuſpected, that the iſland of Great Britain was formerly united to the continent of France. On the coaſt of France, England, Holland and Germany, the ſea has retreated in many parts. In Italy, a conſiderable tract of territory has been gained by the retreating of the ocean; and Ravenna, which was formerly a ſea-port of the Exarques, is no longer a maritime town.

On the mountain of Stella, in Portugal, is a lake in which the wrecks of ſhips have been found, notwithſtanding this mountain is more than twelve leagues diſtant from any ſea. Sabinus, in his commentaries on Ovid's Metamorphoſes, ſays, that from the monuments of hiſtory it appears, that in the year 1460, a whole ſhip, with its anchors, was found in a mine of the Alps.

CHAP. V.

ANALOGIES BETWEEN ANIMALS AND VEGETABLES—ON THE NATURE OF MAN—OF INFANCY—MANHOOD—EXTENT OF HUMAN LIFE—OF THE SENSES—ANECDOTES ILLUSTRATIVE OF THIS SUBJECT.

AMONG the vaſt variety of objects in which the ſurface of this globe abounds, animals hold the firſt rank, both on account of the relation which they bear to man, and of their ſuperiority over vegetable and inanimated nature. The ſenſes, the figure, and the motions of animals, afford them a more intimate connection with ſurrounding objects than vegetables poſſeſs. The latter, however, from their expanſion, their growth, and the variety of ports which compoſe them, are more intimately related to external objects than minerals or ſtones, which are perfectly inert, and deſtitute of every vital principle. It is this number of relations alone which renders the animal ſuperior to the vegetable, and the vegetable to the mineral.

What a variety of ſprings, of powers, and of mechanical movements, are included in that ſmall portion of matter of which the body of an animal is compoſed! What a number of relations, what harmony, what correſpondence among the different parts! How many combinations, arrangements, cauſes, effects, and principles all conſpiring to accompliſh the ſame grand deſign!

But how admirable ſoever this work may appear, the greateſt miracle is not exhibited in the individual. It is in the ſucceſſive renovation, and in the continued duration of the ſpecies, that nature aſſumes an aſpect inconceivable and aſtoniſhing. This faculty of reproduction, which is peculiar to animals and vegetables, muſt, with regard to us, continue to be ſo profound a myſtery, that we ſhall probably never be able to inveſtigate it with ſufficient accuracy.

Even inanimated bodies have ſome properties, and the moſt imperfectly organized matter poſſeſſes many relations with the other parts of the univerſe. We will not aſſert, however, that matter under whatever form it appears, is conſcious of its exiſtence, and of its relative powers. We ſhall only ſay, that being ignorant of the extent of our own connections with external objects, we will not heſitate to pronounce inanimated matter to be infinitely more ſo. Beſides, as our ſenſations have not the moſt diſtant reſemblance to the cauſes that produce them, analogy obliges us to conclude that dead matter is neither endowed with ſentiment, ſenſation, nor even with a conſciouſneſs of its own exiſtence.

With inanimated matter, therefore, we have no other relations than what ariſe from, the general properties of bodies, extenſion, impenetrability, gravity, &c. But, as relations purely material make no impreſſion on us, and as they exiſt entirely independant of us, they cannot be conſidered as any part of our being. Our exiſtence, therefore, is an effect of organization, of life, of the ſoul. Matter, in this view, is not a principal but an acceſſary. It is a foreign covering united to us in a manner unknown. But in order to give a more perfect idea of the nature of man, let us trace him through the different ſtages of his exiſtence.

At its birth, the infant is expoſed to a new element, the air. What the ſenſations are on the admiſſion of this element into the lungs, it is impoſſible to conjecture; but, from the cries of the infant, we have reaſon to believe that it is attended with pain. The eyes of an infant are indeed open, but they are dull, and appear to be unfitted for the performance of any office whatever; and the outward coat of them is wrinkled. The ſame reaſoning will apply to moſt of the other ſenſes. It is not till after forty days that it begins to ſmile; nor is it till then that it begins to weep. Its former ſenſations of pain are unaccompanied with tears. The ſize of an infant born at the full time, is twenty-one inches, though ſome do not exceed fourteen; and it generally weighs twelve, and ſometimes fourteen pounds. The form of the body and members of a new-born infant are by no means perfect. At the end of three days, there generally appears a kind of jaundice; and at that time, there is generally milk in the breaſt of the infant, which is ſqueezed out with the fingers. The ſkull of infants is not compleatly formed. In the language of the nurſery, the head is open in a particular part; that is, the ſkull bones have not yet grown far enough to meet. In this opening, a palpitation may ſometimes be diſcovered; and the beating of the arteries may always be felt. Above this opening, a ſpecies of ſcurf appears, which is rubbed off with a bruſh. In this country, infants, as ſoon as born, are injudiciouſly and unnaturally laced with bandages, which renders them unable to move a ſingle joint. Nations which we call barbarous, act more rationally in this reſpect. The Siameſe, the Indians, the Japaneſe, the Negroes, the Savages of Canada, of Virginia, of Braſil, and almoſt all the inhabitants of South America, lay their infants naked in hanging beds of cotton, or in cradles lined with fur.

Infants ſleep much, but their ſleep is often interrupted. They ought to have the breaſt every two hours in the day, and in the night as often as they awake. It is of great importance to keep children clean and dry from their excrements. The American Indians, who cannot change their furs as frequently as we can do our clothes, put under them the duſt of rotten wood, and renew it as often as it gets damp. Great evils enſue from the negligence of nurſes. Infants are ſometimes left to cry for a conſiderable time, which often occaſions diſeaſes, or, at leaſt, throws them into a ſtate of laſſitude, which deranges their conſtitutions. To palliate this they are ſometimes put into a cradle and rocked to ſleep, which may occaſionally derange the ſtomach and head. Before children are put up into the cradle, we ought to be certain they want nothing, and when they are rocked, it ought never to be with ſuch violence as to ſtun or ſtupify them. The eyes of children are always directed towards the light, and if one eye only be directed to it, the other will probably become weak; both eyes ought, therefore, to be equally ſhaded, or equally expoſed. Squinting is commonly the effect of injudicious treatment in this reſpect. For the firſt two or three months the diet of the infant ought chiefly to be confined to its mother's milk.

The eight inciſores, or fore-teeth, appear firſt. They are produced generally by pairs, and from two months old to ten or twelve. The four canini (or dog-teeth) appear commonly about the 9th or 10th month. About the cloſe of the firſt, or in the courſe of the ſecond year, 16 other teeth appear, called *molares*, or grinders. In the 5th, 6th, or 7th year the fore-teeth, and the dog-teeth, and the firſt ſix of the grinders, naturally ſhed, and a new ſet appears. At the age of puberty, or later, the *dentes ſapientiæ*, or wiſe teeth, appear. Women are ſaid to have fewer teeth than men.

The hair of moſt infants is exceedingly light, almoſt white. When a child is ſuffered to cry violently, and too long, it is in danger of a rupture, but the early application of bandages or truſſes will frequently remove the complaint.

The frame of infants is leſs ſenſible of cold than during any other ſeaſon of life. The pulſe is ſtrong, and it is therefore fair to conclude, that the internal heat is conſiderable. Small animals for the ſame reaſon have more heat than great ones; becauſe the action of the heart and arteries increaſes in proportion to the comparative ſmallneſs of the animal. Till the age of three years the life of infants is extremely precarious; in the courſe of the enſuing ſecond and third years it becomes more certain, and at ſix or ſeven a child has greater probability of living than at any other period of life. It is remarked that of a certain number of children born at the ſame time, above a fourth die in the firſt year; above a third in two years, and at leaſt one half in three years. By other calculations, it appears that one half of the children born at the ſame time, are not extinct in leſs than ſeven or eight years.

At 12 or 15 months infants begin to liſp. A is the vowel which they pronounce with moſt eaſe. Of the conſonants B, M, P, T, are moſt eaſy. In every language, therefore, *Baba*, *Mama*, *Papa*, are the firſt words that children learn. Some children pronounce diſtinctly in two years, though the generality do not ſpeak for two years and a half, and frequently not ſo ſoon.

Some young perſons ceaſe growing at 14 or 15, while others continue their growth to 22 or 23. In men the body attains its perfect proportion at the age of 30, and in women ſooner. The perſons indeed of women are generally complete at 20. The diſtance between the eyes is leſs in man than in any other animal; in ſome creatures, in fact, the eyes are at ſo great a diſtance, that it is impoſſible they ſhould ever view the ſame object with both eyes at once. Men and apes are the only animals that have eye-laſhes on the lower eye-lid. Other animals have them only on the upper one. The upper eye-lid riſes and falls, the lower has ſcarcely any motion.

The ancients erroneouſly conſidered the hair as a kind of excrement, and believed that, like the nails, it increaſed by the lower part puſhing out the extremity. But the moderns have diſcovered that every hair is a tube, which fills and receives nutriment like the other parts of the body. The roots, they obſerve, do not turn grey ſooner than the extremities, but the whole changes its colour at once. We have known perſons the hair of whoſe heads have become grey in one night.

There is no part of the body which has been ſubject to ſuch changes of faſhion as the hair and the beard. Some people, and among others the Turks, cut the hair off their heads, and let their beards grow. The Europeans, on the contrary, ſhave their beards, and wear their hair. The negroes ſhave their heads in figures at one time, in ſtars at another, in the manner of friars; and ſtill more commonly in alternate ſtripes; and their little boys are ſhaved in the ſame manner. The Talapoins, of Siam, ſhave the heads and the eye-brows of ſuch children as are committed to their care. Every nation ſeems to have entertained different prejudices, at different times, in favour of one part or another of the beard.

The neck ſupports the head, and unites it to the body. This part is much more conſiderable in the greater number of quadrupeds, than in man. But fiſhes, and other animals that have not lungs ſimilar to ours, have no neck whatever. Birds, in general, have the neck longer than any other kind of animal. Thoſe which have ſhort claws, have alſo ſhort necks; thoſe, on the contrary, that have them long, are found to have the neck in proportion.

The human breaſt is outwardly formed in a very different manner from that of other animals. It is larger in proportion to the ſize of the body; and none but man, and ſuch animals as make uſe of their fore feet as hands, ſuch as monkeys, bats, and ſquirrels, are found to have thoſe bones called clavicles, or, as we uſually term them, collar-bones. The breaſts in women are larger than in men; however, they ſeem formed in the ſame manner; and, ſometimes, milk is found in the breaſts of men, as well as in thoſe of women. Birds, and all other oviparous animals, have no teats; but viviparous fiſhes, as the whale and the dolphin, have both teats and milk.

There is little known exactly with regard to the proportion of the human figure; and the beauty of the beſt ſtatues is better conceived by obſervation than by meaſurement. Some who have ſtudied after the ancient maſters, divide the body into ten times the length of the face,

and

and others into eight. They tell us, that there is a ſimilitude of proportion in different parts of the body: thus, that the hand is the length of the face; that the thumb is the length of the noſe; that the ſpace between the eyes is the breadth of the eye; that the breadth of the thickeſt part of the thigh is double that of the thickeſt part of the leg, and treble the thinneſt, &c.

The ſtrength of man is very conſiderable when matured by practice. We are aſſured, that the porters of Conſtantinople carry burthens nine hundred pounds weight. And M. Deſaguliers mentions a man in an upright poſture, who, by diſtributing a certain number of weights, in ſuch a manner that every part of his body bore its ſhare, was able to ſupport a weight of two thouſand pounds.

The ſtrength of a man may be ſtill farther eſtimated by the continuance of his labour, and by the agility of his motions. Men, who are exerciſed in running, outſtrip horſes, or at leaſt continue their ſpeed for a greater length of time. In a journey, after a man and a horſe have proceeded together for ſeveral days, the former will be freſh when the latter will be quite tired. The royal meſſengers of Iſpahan run thirty-ſix leagues in fourteen or fifteen hours. Travellers aſſure us, that the Hottentots out-run lions in the chace; and that the ſavages who hunt the elk, purſue this animal, which is as fleet as a ſtag, with ſuch ſpeed that they take it. The civilized man is ignorant of his own ſtrength, nor is he ſenſible how much he loſes of it by effeminacy, and how he might add to it by the habit of vigorous exerciſe.

To complete our deſcription of man, it will be proper to inveſtigate the human countenance, as it appears among ourſelves, when agitated by the paſſions. In affliction, in joy, in love, in ſhame, in compaſſion, the eyes are apt to be ſwelled, and as it were obſcured by an overflow of tears. The effuſion of theſe is always accompanied with a tenſion of the muſcles of the viſage, by which there is occaſioned an opening of the mouth. At the ſame time, the natural moiſture in the noſe becomes more copious, and, by internal paſſages, mixes itſelf with the lachrymal moiſture; which, however, flows only at intervals, not always.

The two corners of the mouth are lowered, by grief, the under lip is erected, the eye-lid is half cloſed, the pupil of the eye is raiſed, and almoſt covered with the eye-lid. And the other muſcles of the face are ſo much relaxed, that the ſpace between the mouth and the eyes is larger than ordinary, and conſequently the countenance aſſumes a lengthened appearance.

Fear, terror, or horror, wrinkles the forehead, raiſes the eye-brow, extends the eye-lids as much as poſſible, and diſcovers a part of the white of the eye over the pupil, which is lowered, and ſomewhat concealed by the inferior eye lid. The mouth, at the ſame time, is widely opened, and the lips being ſeparated, both the upper and under teeth appear.

Contempt or deriſion, raiſe the upper lip on one ſide, and on the other there is a little motion, as if in order to ſmile. The noſe is ſhrivelled on the ſame ſide on which the lip is raiſed, and the corner of the mouth is extended. The eye on the ſame ſide is almoſt ſhut, while the other is open as uſual, but the pupil of each is lowered, as when one looks downward.

By jealouſy, malice, and envy, the eye-brow falls down, and is knit, the eye-lid is raiſed, and the pupil lowered. The under-lip is raiſed on each ſide, while the corners of the mouth are rather lowered, and the middle of the under-lip is raiſed, in order to join the middle of the upper one.

The two corners of the mouth are extended by laughter, and ſomewhat raiſed. The upper part of the cheeks is raiſed, and the eyes are more or leſs cloſed. The upper lip too is raiſed, while the under one is lowered; and, in moderate laughter, the mouth is opened, and the ſkin of the noſe is contracted. Where there is a good natural conſtitution of the body, it is not impoſſible, by moderating the paſſions, temperance and ſobriety, to extend the period of life for a few years. But even of this there ſeems to be an uncertainty; for, if it is neceſſary that the body ſhould employ its whole ſtrength, that it ſhould conſume whatever it is capable of conſuming, that it ſhould undergo every poſſible exerciſe, whence could any benifit accrue from regimen, and from abſtinence? Men no doubt there are who have outlived the uſual period of human exiſtence. Not to mention Par, who lived to the age of one hundred and forty-four, and Jenkins, to that of one hundred and ſixty-five, as recorded in the Philoſophical Tranſactions; we have many inſtances of the prolongation of life to one hundred and ten, and even to one hundred and twenty years. Yet this longevity was owing to no peculiar art or management. On the contrary, it appears, that the greater number of ſuch long livers were peaſants accuſtomed to the greateſt fatigues, huntſmen, or labourers; men, in fact, who had employed their whole bodily ſtrength, and even abuſed it, if it be poſſible to abuſe it by any thing but by continual idleneſs and debauchery.

If in the duration of life there is any difference to be found, it ſeems proper to aſcribe it to the quality of the air. In elevated ſituations, old people are more generally found than in low ones. In the mountains of Scotland and Wales, Auvergne and Switzerland, there have been more inſtances of extreme longevity than in the plains of Holland or Flanders, of Germany or Poland. Human life is however nearly the ſame in every country. Accidental diſtreſs excepted, the common verge of exiſtence is ninety or an hundred years, which has been the caſe ſince the days of David, without much variation.

The following table of the probabilities of human life, has been compiled from a careful examination of many country regiſters of burials in France, compared with the mortality bills of Paris.

TABLE

OF THE PROBABILITIES OF THE DURATION OF LIFE.

Age.	Duration of Life.		Age.	Duration of Life.		Age.	Duration of Life.	
Years	Years	Months	Years	Years	Months	Years	Years	Months
0	8	0	29	28	6	58	12	3
1	33	0	30	28	0	59	11	8
2	38	0	31	27	6	60	11	1
3	40	0	32	26	11	61	10	6
4	41	0	33	26	3	62	10	0
5	41	6	34	25	7	63	9	6
6	42	0	35	25	0	64	9	0
7	42	3	36	24	5	65	8	6
8	41	6	37	23	10	66	8	0
9	40	10	38	23	3	67	7	6
10	40	2	39	22	8	68	7	0
11	39	6	40	22	1	69	6	7
12	38	9	41	21	6	70	6	2
13	38	1	42	20	11	71	5	8
14	37	5	43	20	4	72	5	4
15	36	9	44	19	9	73	5	0
16	36	0	45	19	3	74	4	9
17	35	4	46	18	9	75	4	6
18	34	8	47	18	2	76	4	3
19	34	0	48	17	8	77	4	1
20	33	5	49	17	2	78	3	11
21	32	11	50	16	7	79	3	9
22	32	4	51	16	0	80	3	7
23	31	10	52	15	6	81	3	5
24	31	3	53	15	0	82	3	3
25	30	9	54	14	6	83	3	2
26	30	2	55	14	0	84	3	1
27	29	7	56	13	5	85	3	0
28	29	0	57	12	10			

By this Table it appears, that we may lay our bett one to one, that an infant newly born will live eight years; that an infant of one year will live thirty-three years longer; that an infant of two years will live thirty-eight years longer; that a man of twenty will live thirty-three years and five months longer; that a man of thirty will live twenty-eight years longer; and ſo proportionally of every other age.

Ideas of external things are conveyed to the ſoul of man by means of the five ſenſes, *ſeeing*, *hearing*, *feeling*, *taſting*, and *ſmelling*. The organs by which the ſenſes act are the nerves, which are ſmall thread-like fibres diſtributed over the whole body, and all of them connected with the brain.

The eyes ſeem to be formed very early in the human embryo. In the chicken alſo, of all the parts that are double, they are the ſooneſt produced; and I have obſerved upon the eggs of ſeveral ſorts of birds, as well as upon thoſe of lizards, that the eyes were much larger and earlier in their expanſion, than any other parts of two-fold growth. Though in viviparous animals, and particularly in man, they are, at firſt, by no means ſo large in proportion as in the oviparous claſſes, yet they obtain their due formation ſooner than any other parts of the body. This is alſo the caſe with the organ of hearing. The little bones that aſſiſt in conſtructing the internal parts of the ear, are entirely formed before any of the other bones have acquired any part of their growth or ſolidity. Hence it is evident, that the parts of the body, which are furniſhed with the greateſt quantity of nerves are thoſe which appear firſt, and which firſt attain to perfection.

Mr Cheſelden, having couched for a cataract a lad of thirteen years of age, who had from his birth been blind, and thus communicated to him the ſenſe of ſeeing, was at great pains to mark the progreſs of his viſual powers. This youth, though hitherto incapable of ſeeing, was not, however, abſolutely and entirely blind. Like every other perſon, whoſe viſion is obſtructed by a cataract, he could diſtinguiſh day from night, and even black from white, or either from the vivid colour of ſcarlet. Of the form of bodies, however, he could diſtinguiſh nothing, nor of colours themſelves, unleſs the light was ſtrong. At firſt the operation was performed only upon one of his eyes; and when he ſaw for the firſt time, he was ſo far from forming the leaſt conception of diſtances, that he ſuppoſed (as he himſelf expreſſed it) every thing he ſaw touched his eyes, in the ſame manner as every thing he felt touched his ſkin. The objects that pleaſed him moſt were thoſe of which the ſurfaces were plain, and the figures regular; though he could neither judge of their different forms, nor give any reaſon why he preferred ſome to others. The ideas he had entertained of colours, during his former dark ſtate, were ſo imperfect that, when he ſaw them in reality, he could hardly be perſuaded they were the ſame. When ſuch objects were ſhewn him as he had been formerly familiar with, by the touch, he beheld them with earneſtneſs, in order to diſtinguiſh them a ſecond time. As of theſe, however, he had too many to retain at once, the greateſt number were forgot; and for one thing which he recollected upon ſeeing a ſecond time, there were a thouſand of which he had not the leaſt remembrance. He was very much ſurpriſed to find that thoſe perſons, and thoſe objects, which he had loved beſt, were not the moſt pleaſing to the eye. Nor could he help expreſſing his diſappointment in finding his parents leſs handſome than he had conceived them to be. Before he could diſtinguiſh that a picture reſembled a ſolid body, above two months elapſed. Till then, he only conſidered it as a ſurface diverſified by a variety of colours: but, when he began to perceive that theſe ſhadings actually repreſented human beings, he alſo began to examine, by the touch. whether they had not the uſual qualities of ſuch bodies; and great was his ſurpriſe to find what he had imagined a very unequal ſurface, to be ſmooth and even. He was then ſhewn a miniature-portrait of his father, which was contained in his mother's watch-caſe; and though he readily perceived the reſemblance, yet he expreſſed his aſtoniſhment, how ſo large a face could be compriſed in ſo ſmall a compaſs. To him it appeared as ſtrange as that a pint-veſſel ſhould contain a buſhel. At firſt, he could bear but a very ſmall quantity of light, and he ſaw every object much greater than the life. But in proportion as he obſerved objects that were really large, he conceived the others to be diminiſhed. Beyond the limits of what he ſaw, he had no conception of any thing. Although he knew that the apartment he occupied was only a part of the houſe, he could not conceive how the latter ſhould ſeem larger than the former. Before the operation he had no great expectation of the pleaſure he ſhould receive from the new ſenſe he was promiſed. That by it he might be enabled to read and write, was his grand object. He ſaid, that he could enjoy no greater ſatisfaction from walking in the garden, with this ſenſe, than without it; becauſe there he already walked at his eaſe, and knew all the walks. With great truth he alſo obſerved, that his blindneſs gave him one advantage over the reſt of mankind; an advantage which indeed he retained long after he had acquired the ſenſe of ſeeing; namely, that of being able to walk in the dark with confidence and ſecurity. He no ſooner, however, had begun to enjoy this new ſenſe, than he was tranſported beyond meaſure; and he declared that every new object opened to him a freſh ſource of delight. About a year after, he was carried to Epſom, where there is a beautiful, and an extenſive proſpect. With this he ſeemed greatly charmed; and the landſcape before him he called a new method of ſeeing. He was couched in the other eye, a year after, and of both operations the ſucceſs was equal. When he ſaw with both eyes every thing appeared to him twice as big as when he ſaw but with one, although he did not ſee double, or at leaſt he diſcovered no marks from which any ſuch concluſion could be inferred.

Diſtance is only conceived by experience, for the more diſtant an object is, the leſs it appears. When, from certain circumſtances, we cannot form a juſt conception of diſtance, and when we cannot judge of objects but by the angle, or rather by the image, which they have in our eyes, we are then neceſſarily deceived as to their ſize. Every man has felt how liable we are in travelling by night to miſtake a buſh which is near for a tree at a diſtance, or indeed a diſtant tree for a buſh at hand. In the ſame manner, if we do not diſtinguiſh objects by their ſhape, and if we cannot by it judge of diſtance, the ſame fallacy will ſtill continue. In this caſe, a fly, which may paſs before us with rapidity, will ſeem to be a bird at a conſiderable diſtance; and a horſe which may be in the middle of a plain, not moving, and in an attitude ſimilar, for inſtance, to that of a ſheep, will ſeem to be no bigger than a ſheep, till we have found out that it is a horſe.

If, therefore, we are benighted in a ſtrange place, where no judgment can be formed of diſtance, we are every moment liable to deceptions of viſion. Hence originate the dreadful ſtories of ſpectres, and of thoſe wonderful, hideous, and gigantic figures, which ſo many perſons ſpeak of having ſeen. Though ſuch figures it is commonly aſſerted, exiſt ſolely in the imagination, yet it is highly probable, that they might appear to the eye, in every different reſpect deſcribed to us. This remark will be allowed to be the more probable, when we conſider, that whenever we cannot judge of an object but by the angle which it forms in the eye, this object is magnified according to its propinquity. And that, if it ſeemed at firſt to the ſpectator who is equally incapable of diſtinguiſhing what he ſees, and of judging at what diſtance he ſees it, when at the diſtance of twenty or thirty paces from it, a few feet high, it muſt look to him, when within a few feet of it, of a ſize ſtupendouſly increaſed. At this he muſt naturally be terrified, till he touches and diſtinguiſhes the ſeemingly gigantic object, for in the very inſtant that he has an actual perception of what it is, the object will diminiſh, and appear to him what it really is. If, on the other hand, he is afraid to approach it, and he flies from the ſpot with precipitation, the only idea he will form of what had preſented itſelf to him, will be that of an image, gigantic in its ſize, and dreadful in its form. This prejudice about ſpectres, therefore, originates from nature; and ſuch viſions depend not, as philoſophers have ſuppoſed, upon the imagination only.

We have ſeveral reaſons for ſuppoſing that ſuch perſons as are ſhort-ſighted ſee objects larger than others; and yet it is a certain fact that they ſee them leſs.

Deception is not however confined to one ſenſe; ſo that hearing is liable to ſimilar miſtakes with ſight. By this ſenſe no diſtinct intelligence is conveyed of the diſtance whence a ſounding body is heard. A great noiſe if diſtant, and a ſmall one very near, produce the ſame feeling; and, unleſs we receive information from ſome other ſenſe, we can never tell accurately whether the ſound be great or ſmall. It is not till we have by experience, become acquainted with any particular ſound, that we can judge of the diſtance whence we hear it. When, for example, we know the tone of a bell, we are then at no great loſs to determine how far it is from us.

Every body that ſtrikes againſt another produces a ſound, which is ſimple in ſuch bodies as are not elaſtic, but which is often repeated in ſuch as are. If we ſtrike a bell, for inſtance, a ſingle blow produces a ſound, which is repeated by the undulations of the ſonorous body, and which is multiplied as often as it happens to undulate or vibrate. Theſe undulations ſucceed each other ſo faſt, that the ear ſuppoſes them one continued ſound; whereas they form many ſounds. Sounding bodies are therefore of two kinds, to wit, non-elaſtic and elaſtic. The former when ſtruck return but a ſingle ſound, and the latter return a ſucceſſion of ſounds which form a tone. This tone may be conſidered as a great number of ſounds, all produced one after the other, by the ſame body, as we find in a bell which continues to ſound for ſome time after it is ſtruck. A continuing tone may alſo be produced from a non-elaſtic body, by repeating the blow quick and often, as when we beat a drum, or when we draw a bow along the ſtring of a fiddle.

To know the manner in which muſical ſounds become pleaſing, it muſt be obſerved, no one continuing tone, how loud or ſwelling ſoever, can afford us delight. We muſt have a ſucceſſion of them, and thoſe in the moſt pleaſing proportion. The nature of this proportion may be thus conceived. If we ſtrike a body incapable of vibration with a double force, or, what amounts to the ſame thing, with a double maſs of matter, it will produce a ſound that will be double grave. Muſic has been ſaid, by the ancients, to have been firſt invented from the blows of different hammers on an anvil. Suppoſe then we ſtrike an anvil with an hammer of one pound weight, and again with an hammer of two pounds, it is plain that the two pound hammer will produce a ſound twice as grave as the former. But if we ſtrike with a two pound hammer, and then with a three pound, it is evident that the latter will produce a ſound one third more grave than the former. If we ſtrike the anvil with a three pound hammer, and then with a four pound, it will likewiſe follow that the latter will be a quarter part more grave than the former. Now, in comparing between all thoſe ſounds, it is obvious that the difference between one and two is more eaſily perceived than that between two and three, three and four, or any number ſucceeding in the ſame proportion. The ſucceſſion of ſounds will therefore, pleaſe in proportion to the eaſe with which they may be diſtinguiſhed. That ſound which is double the former, or, the octave to the preceding tone, will be the moſt pleaſing. The next to that, which is as two to three, or, the third, will be moſt agreeable. And thus univerſally, thoſe ſounds whoſe differences may be moſt eaſily compared are the moſt agreeable.

Sound has in common with light, the property of being extenſively diffuſed. Like light, it alſo admits reflection. The laws of this reflection, it is true, are leſs diſtinctly underſtood than thoſe of light. All we know is, that ſound is principally reflected by hard bodies, and that their being hollow alſo ſomtimes increaſes the reverberation. The internal cavity of the ear, which is faſhioned out in the temporal bone, like a cavern cut into a rock, ſeems to be fitted for the purpoſes of echoing ſound with the greateſt preciſion.

One of the moſt common complaints in old age is deafneſs; which probably proceeds from the rigidity of the nerves in the labyrinth of the ear. This diſorder alſo proceeds ſometimes from a ſtoppage of the wax, which art may eaſily remedy. In order to know whether the defect be an internal or an external one, let the deaf perſon put a repeating-watch into his mouth; and if he hears it ſtrike, he may be aſſured that his diſorder proceeds from an external cauſe.

It often happens, that people hear better with the one ear than with the other; but theſe have, what muſicians call, a bad ear. I have made ſeveral experiments on perſons of this deſcription; and I have uniformly found, that their defect in judging properly of ſounds proceeds from the inequality of their ears, and from their receiving by both at the ſame time, unequal ſenſations. In like manner, as ſuch perſons hear falſe, they alſo, without knowing it, ſing falſe. They alſo frequently deceive themſelves with regard to the ſide whence the ſound comes, generally ſuppoſing the noiſe to come on the part of the beſt ear.

Hearing is a much more neceſſary ſenſe to man than to animals. In theſe it is only a warning againſt danger, or an encouragement to mutual aſſiſtance. In man, it is the ſource of moſt of his pleaſures; and without it the reſt of his ſenſes would be of little benefit. A man born deaf, muſt neceſſarily be dumb; and his whole ſphere of knowledge muſt be bounded by ſenſual objects. We have a ſingular inſtance of a young man, who, being born deaf, was reſtored, at the age of twenty-four, to perfect hearing. The account which is given in the memoirs of the Academy of Sciences, 1703, page 18, is as follows:

" A young man, of the town of Chartres, between the age of twenty-three and twenty-four, the ſon of a tradeſman, and deaf and dumb from his birth, began to ſpeak all of a ſudden, to the utter aſtoniſhment of the whole town. He gave them to underſtand that, about three or four months before, he had heard the ſound of the bells, and was greatly ſurpriſed at this new and unknown ſenſation. After ſome time, a kind of humour iſſued from his left ear, and he then heard perfectly well with both. During theſe three months, he liſtened to every thing; and without attempting to ſpeak aloud he accuſtomed himſelf to utter ſoftly the words ſpoken by others. He laboured hard alſo in acquiring the pronunciation of words, and in learning the ideas of which they are expreſſive. At length, having ſuppoſed himſelf qualified to break ſilence, he declared, that he could now ſpeak, though as yet but imperfectly. Soon after, ſome able divine queſtioned him concerning his ideas of his paſt ſtate; and principally with reſpect to God, his ſoul, the moral beauty of virtue and deformity of vice. The young man, however, had not directed his ſolitary ſpeculations into that channel. He had gone to maſs indeed with his parents, had learned to ſign himſelf with the croſs, to kneel down, and to aſſume all the grimaces of a man in the act of devotion. But he did all this without any manner of knowledge of the intention or the cauſe; he ſaw others do the like, and that was enough for him. He had formed no idea of death; but he led a life of pure animal inſtinct; and though entirely taken up with ſenſible objects, and ſuch as were preſent, he yet did not ſeem to have made ſuch reflections even upon theſe, as might reaſonably have been expected. The young man was not, however, deficient in underſtanding; but the underſtanding of a man, deprived of all commerce with others, is ſo very confined, that the mind may be ſaid to be under the controul of its immediate ſenſations.

" It is highly poſſible, nevertheleſs, to communicate ideas to deaf men, which they previouſly wanted, and even to give them very preciſe notions of abſtract, and general ſubjects, by means of ſigns, and of letters. A perſon born deaf, may, by time and application, be taught to read, to write, and even, by the motions of the lips, to underſtand what is ſaid to him. This is a plain proof how much the ſenſes reſemble, and may ſupply the defects of each other. It is probable, however, that, as moſt of the motions of ſpeech are made within the mouth by the tongue, the knowledge from the motion of the lips, can be but very confined.

The ſenſe of feeling is ſpread over the whole body, but it employs itſelf differently in different parts. The ſenſation which reſults from feeling, cannot be excited otherwiſe than by the contact and immediate application of the ſuperficies of ſome foreign body to that of our own. If we apply a foreign body againſt the breaſt, or upon the ſhoulder of a man, he will feel it; that is, he will know that there is a foreign body which touches him. But he will not have a ſingle idea of the form of this body, becauſe the breaſt touching the body in a ſingle plain, or ſurface, he cannot gather from it, any knowledge of this body. It is the ſame with reſpect to all other parts of the body, which cannot adjuſt themſelves upon the ſurface of foreign bodies, and bend themſelves, to embrace at one time, many parts of their ſuperficies. Theſe parts of our body cannot, therefore, give any juſt idea of their form; but thoſe on the contrary, which, like the hand, are divided into many ſmall flexible and moveable parts; and which conſequently, can apply themſelves at one and the ſame time, upon the different plains of the ſuperficies of the body, are thoſe, which, in effect, give us the ideas of their form, and of their ſize.

It is not, therefore, only becauſe there is a greater quantity of nervous tufts, at the extremity of the fingers than in any other part of the body. It is not, as it is vulgarly pretended, becauſe the hand has the moſt delicate ſenſe, that it is in effect the principal organ of feeling. On the contrary, we can ſay, that there are parts more ſenſible, and where the ſenſe of feeling is more delicate, as the eyes, the tongue, &c. But it is merely becauſe the hand is divided into many parts all moveable, all flexible, all acting at ſame time, and all obedient to the will; it is, becauſe, it is the only organ which gives us diſtinct ideas of the form of bodies. Animals which have hands, appear to be the moſt acute. Apes do things ſo like the mechanical actions of man, that it ſeems as if they had the ſame ſucceſſion of corporeal ſenſation for the cauſe of them. Animals, which are deprived of this organ, as they cannot graſp any object, and as they have not any part divided and flexible enough to be able to adjuſt itſelf upon the ſuperficies of bodies, they certainly have not any preciſe notion of the form, or of the ſize of them. It is for this reaſon that we often ſee them in ſuſpence, or frightened at the aſpect of objects which are the moſt familiar to them. The principal organ of their feeling is the muzzle, as this part is divided in two by the mouth and as the tongue is another part, that ſerves them at the ſame time to touch bodies which we ſee them turn and turn again before they take them between their teeth.

It is therefore to the ſenſe of feeling that we are indebted for the power of uſefully exerciſing all our other faculties. One man does not, perhaps, poſſeſs more ingenuity or capacity than another; but becauſe in his earlieſt infancy he made a greater, and a readier uſe of this ſenſe. As ſoon as children are indulged with the liberty of their hands, they preſently bring them into action, and are fond of touching whatever is preſented to them. They are ſeen to amuſe themſelves, and to take a pleaſure in handling every thing they are capable of graſping. They ſeem as if they were endeavouring to find out the form of bodies, by touching them on every ſide; and for a conſiderable time, they amuſe themſelves in this manner, or rather they inform themſelves of new objects.

CHAP. VI.

OF THE APPARENT VARIETIES IN THE HUMAN SPECIES—LAPLANDERS—TARTARS—CHINESE—JAPANESE—FORMOSANS—MOGULS—PERSIANS—ARABIANS—CIRCASSIANS—TURKS—RUSSIANS—NEGROES—HOTTENTOTS—AMERICANS—CAUSES OF THIS VARIETY.

THERE are many cauſes which contribute to the producing of an apparent variety between the different nations of the globe. Climate, food, manners and cuſtoms produce not only a difference in ſentiment, but even in the external form of different people.

In examining the ſurface of the earth, and beginning our enquiries from the north, we find in Lapland, and in the northern parts of Tartary, a race of ſmall-ſized men, whoſe figure is uncouth, and whoſe phyſiognomy is as wild as their manners are unpoliſhed. Though they ſeem to be of a degenerate ſpecies, they are very numerous, and occupy vaſt regions.

The Laplanders, the Danes, the Swedes, the Muſcovites, the inhabitants of Nova-Zembla, the Borandians, the Samoeids, the Oſtiacs of the old continent, the Greenlanders, and the ſavages to the north of the Eſquimaux Indians of the new continent, appear to be of one common race, which has been extended and multiplied along the coaſts of the northern ſeas, and over deſarts, conſidered as uninhabitable by every other nation. In theſe countries, the viſage is large and broad, the noſe is flat and ſhort, the eyes are of a yellowiſh brown, inclining to black, the eye-lids are drawn toward the temples, the cheek-bones are extremely prominent, the mouth is very big, the lower part of the countenance is very narrow, the lips are thick and turned outward, the voice is ſhrill, the head is bulky. The hair is black and ſtraight, and the ſkin is tawny. They are ſmall in ſtature, and, though meagre, they are of a ſquat form. In general, their ſize is about four feet, nor do the talleſt exceed four and a half; and among theſe people, if there is any difference to be found, it depends on the greater or leſs degree of deformity.

The Daniſh Laplanders have a large black cat, which they make a confident of all their ſecrets, and a counſellor in all their difficulties. Among the Swediſh Laplanders, there is in every family a drum, for the purpoſe of conſulting the devil: and notwithſtanding the natives of theſe countries are robuſt and nimble, from many circumſtances there is reaſon to ſuppoſe, that they cannot live but in their own country, and in their own manner. In travelling over the ice and ſnow, they uſe ſkates made of fir, which are about two feet long, and about half a foot broad, which are raiſed and pointed before, and faſtened to the foot by ſtraps of leather. With theſe they make ſuch diſpatch, that they eaſily overtake the ſwifteſt animals. They alſo uſe a pole, pointed with iron at one end, and rounded at the other. This pole ſerves to puſh them along, to direct their courſe, to keep them from falling, to ſtop the impetuoſity of their career, and to kill what game they overtake. With their ſkates they deſcend the ſteepeſt mountains, and ſcale the moſt craggy precipices; nor are the women leſs ſkilful in ſuch exerciſes than the men. They are all accuſtomed to the bow and arrow; and it is aſſerted, that the Muſcovite Laplanders launce a javelin with ſo much dexterity, that at the diſtance of thirty paces, they are ſure to hit a mark no larger than a ſilver crown, and with ſuch force, that it will transfix a human body. As huntſmen, their favourite purſuit is that of the ermine, the fox, the lynx, and the martin; and of theſe animals, they barter the ſkins for their favourite articles of luxury, brandy and tobacco.

In winter the Laplanders clothe themſelves with the ſkin of the rein-deer, and in ſummer with the ſkins of birds. To the uſes of linen they are perfect ſtrangers. The women of Nova-Zembla have their noſe and their ears pierced, in order to have them ornamented with pendants of blue ſtone; and alſo, as an additional luſtre to their charms, they form blue ſtreaks upon their forehead and chin. Thoſe of Greenland dreſs themſelves with the ſkin of the dog fiſh. They alſo paint the viſage with blue and yellow colours, and wear pendants in the ears. They all live under ground, or in huts almoſt entirely covered with earth, and with the bark of certain trees, or the ſkin of certain fiſhes. Some even form ſubterranean trenches, by which one hut communicates with another, and by which, during the winter-months, they enjoy the converſation and ſociety of their neighbours. A continued ſeries of darkneſs for ſeveral months, obliges them to illuminate their dreary abode with lamps, which they keep alive with that very train-oil they uſe as drink. Under all theſe hardſhips, they are ſubject to few diſeaſes, and they live to a prodigious age. So vigorous indeed are the old men, that they are hardly to be diſtinguiſhed from the young. The only infirmity they experience, and it is an infirmity common to them all, is blindneſs. Dazzled by the ſtrong reflection of the ſnow, in winter, and inveloped in clouds of ſmoke in autumn and ſpring, when advanced in years, they ſeldom retain the uſe of their eyes.

The Tartar country, taken in general, comprehends the greateſt part of Aſia, and extends even from Ruſſia to Kamtſchatka. It is from eleven to twelve hundred leagues long, and about ſeven hundred broad, of courſe its circumference is twenty times larger than that of the whole kingdom of France.

All the Tartar nations have the upper part of the viſage very large and wrinkled, even in their youth. Their noſe is ſhort and flat, their eyes are little, and ſunk in the head; their cheek-bones are high; the lower part of their viſage is narrow; their chin is long and prominent; their teeth are long and ſtraggling; their eye-brows are ſo large as to cover the eyes; their eye-lids are thick; the face is broad and flat; their complexion is tawny, and their hair is black. They have but little beard, have thick thighs, and ſhort legs, and, though but of middling ſtature, they are remarkably ſtrong and robuſt. The ugliеſt of them are the Calmoucks, in whoſe appearance there ſeems to be ſomething frightful. They are all wanderers and vagabonds; and their only ſhelter is that of a tent made of hair or ſkins. Their food is horſe fleſh and camel-fleſh, either raw, or a little ſodden between the horſe and the ſaddle. They eat alſo fiſh dried in the ſun. Their moſt common drink is mare's milk, fermented with millet ground into meal. They all have the head ſhaved, except a tuft of hair on the top, which they let grow ſufficiently long to form into treſſes on each ſide of the face. The women, who are as deformed as the men, wear their hair, which they bind up with bits of copper, and other ornaments of the ſame nature.

The majority of theſe tribes are ſtrangers to religion, morality, and decency. They are robbers by profeſſion; and the natives of Dagheſtan, who live in the neighbourhood of more poliſhed countries, carry on a great traffic of ſlaves, whom they carry off by force, and afterwards ſell to the Turks and the Perſians. Their wealth conſiſts chiefly of horſes, which are more numerous, perhaps, in Tartary, than in any other part of the world. They are taught, by cuſtom, to live in the ſame place with their horſes. They are continually employed in training and exerciſing them; and at length they reduce them to ſuch implicit obedience, that they actually appear to underſtand the intention of the rider.

The limbs of the Chineſe are well-proportioned, their bodies are large and fat, their viſages are large and round. Their eyes are ſmall, their eye-brows are large, their eye-lids are turned upwards, and their noſes are ſhort and flat. Their beards are black, upon their chins there is very little hair, and upon each lip their are not more than ſeven or eight prickles. Thoſe who inhabit the ſouthern provinces of the empire, are more brown and tawny than the others. In colour, they reſemble the natives of Mauritania, and the more ſwarthy Spaniards; but thoſe who inhabit the middle provinces, are as fair as the Germans.

Le Gentel aſſures us, that the Chineſe women do every thing in their power to make their eyes appear little, and oblong. For this purpoſe, it is a conſtant practice with the little girls, from the inſtruction of the mother, forcibly to extend their eye-lids; and with the addition of a noſe thoroughly compreſſed and flattened, of ears long, large, open, and pendant, they are accounted complete beauties. He adds, that their complexion is delicate, their lips are of a fine vermillion, their mouth is well-proportioned, their hair is very black; but that, by the uſe of paint, they ſo greatly injure their ſkin, that, before the age of thirty, they have every appearance of old age.

So ſtrongly do the Japaneſe reſemble the Chineſe, that we can hardly ſcruple to rank them in the ſame claſs. As being inhabitants of a more ſouthern climate, they only differ from them in being more yellow, or more brown. In general, their ſtature is ſmall, their face, as well as their noſe, is broad and flat, their hair is black, and their beard is little more than perceptible. They are haughty, fond of war, full of dexterity and vigour, civil and obliging, ſmooth-tongued, and courteous, but fickle and vain. With aſtoniſhing patience, they ſuſtain hunger, thirſt, cold, heat, fatigue, and all the other hardſhips of life. Their ceremonies, or rather grimaces, in eating, are numerous and uncouth. They are laborious, are very ſkilful artificers, and, in a word, have nearly the ſame diſpoſition, the ſame manners, and the ſame cuſtoms, as the Chineſe.

One cuſtom which they have in common, and which is not a little fantaſtic, is, ſo to contract the feet of the women, that they are hardly able to ſupport themſelves. Some travellers mention, that in China, when a girl has paſſed her third year, they break the foot in ſuch a manner, that the toes are made to come under the ſole; that they apply to it a ſtrong water, which burns away the fleſh; and, that they wrap it up in a number of bandages, till it has aſſumed a certain fold.

They add, that the women feel the pain of this operation all their lives; that they walk with great difficulty; and that their gait is to the laſt degree ungraceful. Other travellers do not ſay that they break the foot in their infancy, but that they only compreſs it with ſo much violence as to prevent its growth; but they unanimouſly allow, that every woman of condition, and even every handſome woman, muſt have a foot ſmall enough to enter, with eaſe, the ſlipper of a child of ſix years old.

Though the inhabitants of the kingdoms of Pegu and Aracan are blacker, yet they bear all a conſiderable reſemblance to the Chineſe. Thoſe of Aracan put great value upon a forehead large and flat; and, in order to render it ſo, they apply a plate of lead to the forehead of their children, as ſoon as they are born. Their noſtrils are large, and extended; their eyes are ſmall and lively; and their ears are of ſuch length as to hang over their ſhoulders. They feaſt with a reliſh on mice, on rats, on ſerpents, and on fiſh, however it may ſtink. Their women are tolerably fair, and their ears are as long as thoſe of the men. The people of Achan, who are ſituated farther to the north than thoſe of Aracan, have alſo a flat viſage, and an olive-coloured ſkin. They allow their boys to go quite naked, and their girls with only a ſlight plate of ſilver over thoſe parts which nature dictates to conceal.

Northward of the Philippine Iſlands is ſituated the iſland Formoſa, of which the natives, though at no great diſtance from the coaſt of Fokian in China, bear not the leaſt reſemblance to the Chineſe. According to Struys the Formoſans are of a ſmall ſtature, particularly thoſe who inhabit the mountains, and their viſage is broad. The women have large and full breaſts, and a beard like the men. Their ears, are naturally long, and they render them ſtill more ſo by certain thick ſhells, which they wear as pendants. Their hair is very black, and very long, and their complexion is yellowiſh. Theſe iſlanders, though averſe to labour, are yet admirably ſkilled in the uſe of the javelin, and bow. They are alſo excellent ſwimmers; and when they run, their ſwiftneſs is incredible.

The Moguls, and the other inhabitants of the peninſula of India, are not unlike the Europeans in ſhape and in features; but they differ more or leſs from them in colour. The Moguls are of an olive complexion; and yet, in the Indian language, the word *Mogul* ſignifies *White*. The women are extremely delicate, and they bathe very often. They are of an olive colour, as well as the men; and, contrary to what is ſeen among the women of Europe, their legs and thighs are long, and their body is ſhort. Tavernier ſays, that, after paſſing Lapor, and the kingdom of Caſhmire, the women have no hair on any part of the body, and the men have hardly any beard. According to Thevenot, the Mogul women are tolerably fruitful, though exceedingly chaſte. They likewiſe ſuffer little from the pains of child-birth, and are often known to be abroad the day following. He adds, that in the kingdom of Decan they are allowed to marry, the huſband by his tenth, and the wife by her eighth year; and at that age they pretty often have children. The women who become mothers ſo ſoon, uſually ceaſe bearing, however, before they arrive at thirty; and by that period, they appear wrinkled, and marked with all the deformities of age.

The cuſtoms of the different nations of India are all very ſingular, if not whimſical. The Banians eat nothing which has had life in it;

and they are even afraid to kill the ſmalleſt reptile, however offenſive to them. They throw rice and beans into their rivers as food for the fiſhes, and grain of different kinds upon the earth for the birds and inſects. When they meet with a huntſman, or a fiſher, they beg of him inſtantly to deſiſt from his employment. If he remain deaf to their intreaties, they offer him money for his gun, or his nets; and when no perſuaſion, no offer, will avail, they trouble the water, in order to frighten the fiſhes, and cry with all their might, to put the birds and other game to flight.

In Ceylan there is a ſpecies of ſavages, denominated *Bedas*, who occupy a ſmall diſtrict on the north part of the iſland; and ſeem to be totally different from all the nations around them. The ſpot they inhabit is entirely covered with wood, amidſt which they keep themſelves ſo cloſely concealed, that it is with great difficulty they are diſcovered. Their complexion is fair, and ſometimes even red, like that of the Europeans. They do not ſpeak the language of Ceylan; nor indeed has their language the leaſt affinity to that of any of the other Indians. They have no villages, no houſes, no intercourſe with the reſt of mankind. Their arms are, the bow and the arrow, with which they deſtroy a number of boars, ſtags, and other animals; and though they never dreſs their meat, they ſweeten it with honey, which they poſſeſs in great abundance.

The inhabitants of Perſia, of Turkey, of Arabia, of Egypt, and of the whole of Barbary, may be conſidered as one and the ſame people, who, in the time of Mahomet, and of his ſucceſſors, invaded immenſe territories, extended their dominions, and incorporated with the original natives of all thoſe countries. The Perſians, the Turks, and the Moors, are to a certain degree civilized; but the Arabians have, for the moſt part, remained in a ſtate of independance, which implies a contempt of laws. They live, like the Tartars, without order, without government, and almoſt without ſociety. Theft, robbery, and violence are authoriſed by their chiefs. They glory in their vices; and of all human conventions, thoſe only have they admitted, which owe their exiſtence to fanaticiſm and ſuperſtition.

They are a people much inured to labour; and to it they habituate their horſes. They allow this animal to eat or drink but once in twenty-four hours; and though their horſes are meagre, they are excellent courſers, and ſeem indefatigable.

The Egyptian women are very brown; their eyes are lively; their ſtature is rather low; their mode of dreſs is by no means agreeable; and their converſation is perfectly tireſome. But though the women of Egypt are commonly rather ſhort, yet the men are of a good height. Both are of an olive colour; and the farther we remove from Cairo, the more we find the people tawny, till we reach the confines of Nubia, where they are as black as the Nubians themſelves.

The moſt inherent defects of the Egyptians are, idleneſs and cowardice. They do nothing almoſt the whole day but drink coffee, ſmoke, ſleep, remain indolent in one place, or chatter in the ſtreets. They are highly ignorant, and are full of the moſt ridiculous vanity. Though they cannot deny but that they have loſt every thing noble they once poſſeſſed; the ſciences, the exerciſe of arms, their hiſtory, and even their language; and that, from an illuſtrious and a valiant nation, they have become a people daſtardly and enſlaved; they ſcruple not to deſpiſe all other nations, and to take offence at the bare offer of carrying their children into Europe, in order to initiate them in the arts and ſciences.

"The women of Circaſſia," ſays Struys, "are exceedingly fair and beautiful. Their complexion is incomparably fine; their forehead is large and ſmooth; and, without the aſſiſtance of art, their eye-brows are ſo delicate, that they appear as threads of ſilk. Their eyes are large, ſoft, but full of animation, their mouth is ſmall and expreſſive of a ſmile, and their chin, forms a perfect oval. Their neck and breaſts are admirably formed; their ſtature is tall, and the ſhape of their body eaſy; their ſkin, is white as ſnow, and their hair of the moſt beautiful black. They wear a little cap of a black ſtuff over which they faſten a roller of the ſame colour; but, what is truly ridiculous, is, that, inſtead of this roller, the widows wear the bladder of an ox, or a cow, inflated as much as poſſible, by which they disfigure themſelves amazingly. In the ſummer months, the inferior claſſes wear nothing but a ſhift, which is open down to the middle, and which is generally of a blue, yellow, or red colour. They are tolerably familiar with ſtrangers, but at the ſame time faithful to their huſbands, who are by no means jealous of them."

The Turks, who purchaſe a vaſt number of theſe women as ſlaves, are a people compoſed of many different nations From the Armenians, the Georgians, the Turcomans, intermixing in the time of the cruſades, with the Arabians, the Egyptians, and even the Europeans, it is hardly poſſible to diſtinguiſh the native inhabitants of Aſia Minor, of Syria, and of the reſt of Turkey. The Turkiſh men are generally robuſt, and tolerably well made; and it is even rare to find among them perſons either hump-backed or lame. The women are generally beautiful, well-proportioned, and free from blemiſhes. They are very fair, becauſe they ſeldom ſtir from home; and when they go abroad they are always veiled.

Before the Czar Peter I. we are told, that the Muſcovites had not emerged from barbariſm. Born in ſlavery, they were ignorant, brutal, cruel, and deſtitute of courage. Men and women bathed promiſcuouſly in ſtoves hated to a degree intolerable to all perſons but themſelves; and on quitting this warm bath, they plunged, like the Laplanders, into cold water. Their food was homely; and their favourite diſhes were cucumbers, or melons, of Aſtracan, which, in ſummer, they preſerved in a mixture of water, flour, and ſalt. From ridiculous ſcruples they abſtained from ſeveral viands, amongſt which were pigeons and veal. Nevertheleſs, at this period of rudeneſs, the women were ſkilled in the arts of colouring the ſkin, of plucking out the eye-brows, and of painting artificial ones. They alſo adorned themſelves with pearls and jewels, and their garments were made of rich and valuable ſtuffs. From theſe circumſtances does it not appear, that the barbariſm of the Muſcovites was near a cloſe, and that their ſovereign had leſs trouble in poliſhing them than ſome authors have endeavoured to inſinuate? They are now a people in ſome degree civilized and commercial, fond of ſpectacles, and of other ingenious novelties.

From the regions of Europe and Aſia, our attention is now to be directed to a race of people differing more from ourſelves in external appearances than any we have hitherto mentioned.

In the ſeventeenth or eighteenth degree of north latitude, on the African coaſt, we find the negroes of Senegal and of Nubia, ſome in the neighbourhood of the ocean, and others in that of the red ſea. After them, all the nations of Africa, from the latitude of eighteen North to that of eighteen South, are black, the Ethiopians, or Abyſſinians excepted. It appears, then, that the portion of the globe which Nature has allotted to this race of men, contains an extent of ground, parallel to the equator, of about nine hundred leagues in breadth, and conſiderably more in length, eſpecially northward of the equator. Beyond the latitude of eighteen or twenty, there are no more Negroes, as will appear when we come to ſpeak of the Caffres, and of the Hottentots.

By confounding them with their neighbours the Nubians, we have been long in an error, with reſpect to the colour, and the features of the viſage of the Ethiopians. Marmol ſays, that the Ethiopians are abſolutely black, that their viſage is large, and their noſe flat; and in this deſcription the Dutch travellers agree with him. The truth, however, is, that they differ from the Nubians, both in colour and in features. The ſkin of the Ethiopians is brown, or olive-coloured, like that of the ſouthern Arabians, from whom, it is probable, they derive their origin. In ſtature they are tall: the features of their countenance are ſtrongly marked: their eyes are large and beautiful: their noſe is well proportioned: their lips are thin; and their teeth are white. Of the inhabitants of Nubia, on the contrary, the noſe is flat, the lips are thick and prominent, and the countenance is exceedingly black. Theſe Nubians, as well as the Barberins, their weſtern neighbours, are a ſpecies of Negroes not unlike thoſe of Senegal.

The Ethiopians are a people between the extremes of barbariſm and of civilization. Their garments are of cotton, though thoſe of the more opulent are of ſilk. Their houſes are low, and of a bad conſtruction. Their lands, too, are wretchedly neglected. Theſe circumſtances are owing to the behaviour of their nobles, who deſpiſe the tradeſmen and the common people. Each of theſe claſſes, however, lives ſeparate from the other, and has its own villages or hamlets. Unprovided with ſalt at home, they purchaſe it from abroad for its weight in gold. So fond are they of raw meat, that, at their feaſts, the ſecond courſe, which is conſidered as the moſt delicate, conſiſts of it entirely. Though they have vines they have no wine; and their uſual beverage is a ſour compoſition made with tamarinds. They uſe horſes for the purpoſe of travelling, and mules for that of carrying their merchandize. Of the arts or ſciences they have little knowledge. Their language is without rules; and their manner of writing, though their characters are more beautiful than thoſe of the Arabians, is ſo imperfect, that, they take ſeveral days to write a letter. In their mode of ſalutation there is ſomething exceedingly whimſical. Each takes the right hand of the other, and carries it to his mouth; after, the ſaluter takes off the ſcarf of the perſon ſaluted, and faſtens it round his own body: Thus the latter is left half naked, few of the Ethiopians wearing any more than this ſcarf, and a pair of cotton drawers.

The firſt Negroes we meet with, are thoſe who live on the ſouth ſide of Senegal. Theſe people, as well as thoſe who occupy the different territories between Senegal and Gambia, are called *Jaloſes*. They are all very black, well-proportioned, and of a ſize ſufficiently tall. Their features are leſs harſh than thoſe of the Negroes; and ſome of them eſpecially of the female ſex, have features that are far from being irregular. With reſpect to beauty, they value fine eyes, a well made noſe and mouth, and lips of a proportional ſmallneſs moſt. With reſpect to the ground of the picture alone, do they differ from us; for, with them, the colour muſt be exceedingly black and gloſſy. Their ſkin, however, is highly delicate, and ſoft; and, colour excepted, we find among them women as handſome as in any other country of the world. They are uſually very gay, lively and amorous.

Father du Tertre ſays expreſsly, that, if the Negroes are for the moſt part flat-noſed, it is becauſe the parents cruſh the noſes of their children. He adds that they compreſs their lips too, in order to render them more thick; and that, of the few who have undergone neither of theſe operations, the features of the countenance are as comely, the noſe is as prominent, and the lips are as delicate, as thoſe of the Europeans. It appears however, that, among the Negroes in general, thick lips and a noſe broad and flat, are gifts from nature, by which was originally introduced, and at length eſtabliſhed, their cuſtom of flattening the noſe and thickening the lips of ſuch as, at their birth, diſcovered a deficiency in theſe ornaments.

Though the Negroes of Guinea are in general very healthy, yet they ſeldom attain what we term old age. In his own country, a Negroe at the age of fifty, is a very old man; and ſo early as at that of forty, he diſcovers all the marks of being ſo.

The Negroes in general are remarkably innocent and inoffenſive. If properly fed, and not expoſed to bad uſage, they are contented, joyous and obliging; and on their very countenance we may read the ſatisfaction of their ſoul. If hardly dealt with, on the other hand, their ſpirits forſake them, and they droop with ſorrow. Alike impreſſed with a ſenſe of what injuries, and of what favours they have received, to a cruel maſter they are implacable foes. But for an indulgent one, they are ſervants who will exert every effort of which human nature is capable, in order to expreſs to him their zeal and attachment. To their children, their friends, their countrymen, they are naturally compaſſionate and tender. Contented with the little they have, they communicate a ſhare to thoſe who are in indigence. That they have an excellent heart, therefore, is evident; and, in having this, they have the ſeed of every virtue. Their ſufferings demand a tear. Are they not already ſufficiently unhappy in being reduced to a ſtate of ſlavery; in being obliged to work without reaping the ſmalleſt fruits of their labour? To crown their wretchedneſs, muſt they be abuſed, buffeted, treated like brutes? Humanity revolts at the idea of a conduct, which nothing but the thirſt of gold could ever have introduced, and of which, every day will produce an aggravated repetition, till an enlightened legiſlature ſhall put an end to a traffic which diſgraces human nature.

Mr Kolbe, though he has given ſo minute a deſcription of the Hottentots, is ſtrongly of opinion, however, that they are Negroes. Like that of the latter, he aſſures us, their hair is ſhort, black, frizzled and woolly; nor in a ſingle inſtance did he ever obſerve it long.

Though of all the Hottentots the noſe is very flat, and very broad, yet it would not be of that form, did not their mothers, conſidering a prominent noſe as a deformity cruſh it preſently after their birth. Their lips are alſo thick, and their upper lip is particularly ſo: their teeth are very white: their eye-brows are thick: their head is large: their body is meagre; and their limbs are ſlender. They ſeldom live above forty years; and of this ſhort duration of life, the cauſes, no doubt, are, their reſiding continually in the midſt of filth, as alſo their living upon meat that is tainted, of which indeed their nouriſhment chiefly conſiſts. I might dwell longer upon the deſcription of this naſty people; but as moſt travellers have already given very accurate accounts of them, it might be thought unneceſſary in this place. One fact, however, related by Tavernier, I ought not to paſs in ſilence. The Dutch, he ſays, once took a Hottentot girl, ſoon after her birth; and, after bringing her up among themſelves, ſhe became as white as an European. From this circumſtance he preſumes, that all the Hottentots would be tolerably white, were it not for their cuſtom of perpetually begriming themſelves.

Though in America we obſerve leſs variety in the human form than might be expected, it cannot be ſuppoſed, but that in ſuch a diverſity of climates and ſituations, a conſiderable diverſity of inhabitants muſt alſo be found.

In beginning our enquiries, then, we find in the moſt northern parts of America a ſpecies of Laplanders, ſimilar to thoſe of Europe, or to the Samoeids of Aſia; and though, in compariſon of the latter, they are few in number, yet they are diffuſed over a very conſiderable extent of ground. Thoſe who inhabit the lands of Davis's Strait, are of a diminutive ſize, of an olive complexion, and their legs are ſhort and thick. They are ſkilful fiſhers. They eat their fiſh and their meat raw. Their drink conſiſts of pure water, or of the blood of the dog-fiſh. They are alſo very ſtrong, and generally live to a great age. Here, we ſee, therefore, the figure, the colour, and the manners of the Laplanders. But what is truly ſingular is, that, as among the Laplanders of Europe, we meet with the Finlanders, who are white, comely, tolerably tall, and tolerably well made; ſo, among the Laplanders of America we meet with another ſpecies of men, tall, well made, tolerably white, and with features exceedingly regular.

Of a different race from the former ſeem to be the ſavages of Hudſon's Bay, and northward of the land of Labrador. They are ugly, however, diminutive, and unſhapely; and their viſage is almoſt entirely covered with hair, like the ſavages of the country of Yeco, northward of Japan. In ſummer they dwell under tents made of ſkins of the rein-deer. In winter they live under ground, like the Laplanders and the Samoeids, and, like them, ſleep together promiſcuouſly, and without the ſmalleſt diſtinction. They likewiſe live to a great age, though they feed on nothing but raw meat and fiſh. The ſavages of Newfoundland have a conſiderable reſemblance to thoſe of Davis's Strait: they are low in ſtature: they have little or no beard: their viſage is broad and flat: their eyes are large: they are generally rather flatnoſed: and, upon the whole, are far from being unlike the ſavages of the north continent, and of the environs of Greenland.

Beſides theſe ſavages, who are ſcattered over the moſt northern parts of America, we find greater numbers, and which are perfectly different, in Canada, and in the vaſt extent of land to the Aſſiniboils.

Theſe are tolerably tall, robuſt, vigorous, and well made. They have hair and eyes black, teeth very white, a complexion tawny, beard ſcanty, and over the whole of their body hardly a veſtige of hair. They are hardy, indefatigable walkers, and very nimble runners. They are alike unaffected by exceſſes of hunger, and of ſatiety. They are by nature bold and fierce, grave and ſedate. So ſtrongly, indeed, do they reſemble the Oriental Tartars in the colour of the ſkin, the hair, and the eyes, in the ſcantineſs of beard, and of hair, as alſo in diſpoſition, and in manners, that, were they not ſeparated from each other by an immenſe ſea, we ſhould conclude them to be deſcended from that nation. In point of latitude, their ſituation is alſo the ſame, which ſtill farther proves, how powerfully the climate influences not only the colour, but the figure of men.

Mr Fabry, who travelled a prodigious way to the northweſt of the Miſſiſſippi, and viſited places which no European had done before him, and of which, conſequently, the ſavage inhabitants had not been deſtroyed, has aſſured me, that that part of America is ſo deſerted, that he often travelled an hundred, and two hundred leagues, without obſerving a ſingle human face, or the ſmalleſt veſtige of an habitation. He adds, that, whenever he did meet with any habitations, they were always at immenſe diſtances from one another; and that, in each of them, there was frequently not above one family. Sometimes he ſays there were two or three families, but never above twenty perſons together; and between theſe twenty perſons and twenty others, there was generally a ſpace of a hundred leagues at leaſt.

To dwell long on the cuſtoms of ſuch ſavage nations, would, in my opinion, be unneceſſary. It has not been always attended to by authors, that what they have given us for eſtabliſhed cuſtoms, and for the manners of a community, were nothing more than actions peculiar to a few individuals, and often determined by circumſtances, or by caprice. Some nations, they tell us, eat their enemies, ſome burn them, and ſome mutilate them. One nation, they ſay, is perpetually at war; and of another, the grand object is to live in peace; in one country, the child kills his parent, when he has lived to a certain age; and in another, the parent eats his child. All theſe ſtories, on which travellers have with ſo much complacency enlarged, mean nothing more than that one ſavage had devoured his enemy, another had burned or mutilated him, and a third had killed or eaten his child. All theſe things may be known to happen in one, as well as in ſeveral ſavage nations. For every nation in which there is no government, no law, no maſter, no habitual ſociety, ought rather to be termed a tumultuous aſſemblage of men, barbarous and independent. Men who obey nothing but their own private paſſions, and who, incapable of having a common intereſt, are alſo incapable of purſuing one object, and of ſubmitting to fixed and ſettled uſages.

If, however, in the whole of North America, there were none but ſavages to be met with, in Mexico, and in Peru, there were found nations poliſhed, ſubjected to laws, governed by kings, induſtrious, acquainted with the Arts, and not deſtitute of religion.

In the preſent ſtate of theſe countries, ſo intermixed are the inhabitants of Mexico and New Spain, that we hardly meet with two viſages of the ſame colour. In the town of Mexico, there are white men from

Europe, Indians from the north, and from the ſouth of America, and negroes from Africa, &c. inſomuch, that the colour of the people exhibits every different ſhade which can ſubſiſt between black and white. The real natives of the country are very brown, and of an olive colour, well made, and active; and though they have little hair, even upon the eye-brows, yet upon their head, their hair is very long, and very black.

In ſurveying the different appearances which the human form aſſumes in the different regions of the earth, the moſt ſtriking circumſtance is that of colour. This circumſtance has been attributed to various cauſes; but in my opinion experience warrants us to affirm that the heat of the climate is the principal one. When this heat is exceſſive, as at Senegal and in Guinea, the inhabitants are entirely black. When it is rather leſs violent, as on the eaſtern coaſts of Africa, they are of a ſhade more light. When it begins to be ſomewhat more temperate, as in Barbary, in India, in Arabia, &c. they are only brown; and, when it is altogether temperate, as in Europe and in Aſia, they are white. Theſe varieties are wholly owing to their various modes of living. All the Tartars, for example, are tawny, while the Europeans, who live in the ſame latitude, are white. Of this difference the reaſons ſeem to be, that the former are always expoſed to the air; that they have no towns, no fixed habitations; that they ſleep upon the earth, and live coarſely in every reſpect. Theſe circumſtances alone are ſufficient to render them leſs white than the Europeans, to whom nothing is wanting which may render life comfortable and agreeable. Why are the Chineſe more white than the Tartars, whom they reſemble in all the features of the viſage? It is becauſe they live in towns, becauſe they are civilized, becauſe they are provided with every expedient for defending themſelves from the injuries of the weather, to which the Tartars are continually expoſed.

When cold becomes extreme, however, it produces ſome effects ſimilar to thoſe of exceſſive heat. The Samoeids the Laplanders, the Greenlanders, are very tawny; and it is even aſſerted, as we have already obſerved, that, among the Greenlanders, there are men as black as thoſe of Africa. Violent cold, and violent heat, produce the ſame effect upon the ſkin; for theſe two cauſes act by one quality, which they poſſeſs in common. This quality is dryneſs; and as it is a quality of which intenſe cold is equally productive as intenſe heat, ſo by the former, as well as by the latter, the ſkin may be dried up, altered, and rendered as tawny as what we find it among the Laplanders. Cold compreſſes, ſhrivels, and reduces within a narrow compaſs, all the productions of nature. Hence we find the Laplanders, who are perpetually expoſed to all the rigours of the moſt piercing cold, the moſt diminutive of the human ſpecies.

The moſt temperate climate is between the degrees of forty and fifty. There we behold the human form in its greateſt perfection; and there we ought to form our ideas of the real and natural colour of man. Situated under this zone, the civilized countries are, Georgia, Circaſſia, the Ukarine, European Turkey, Hungary, South Germany, Italy, Switzerland, France, and the North of Spain. Of the latter the inhabitants are the moſt beautiful, and the moſt ſhapely, in the world.

As the firſt, and almoſt the ſole, cauſe of the colour of mankind, we ought therefore to conſider the climate; and though upon the ſkin the effects of nouriſhment are trifling, when compared with thoſe of the air and ſoil, yet upon the form they are prodigious. Food which is groſs, unwholeſome, or badly prepared, has a ſtrong and a natural tendency to produce a degeneracy in the human ſpecies. Hence in all countries where the people fare wretchedly, they are more ugly, and more deformed than their neighbours.

The air and the ſoil have alſo great influence, not only on the form of men, but on that of animals, and of vegetables. In comparing the peaſants who live on hilly grounds, with thoſe who live imboſomed in the neighbouring valleys, we find, that the former are active, nimble, well ſhaped, and lively; and the women generally handſome. On the contrary, the latter, in proportion as the air, food and water are groſs, are clumſy, and leſs active and vigorous.

From every circumſtance, therefore, we may obtain a proof, that mankind are not compoſed of ſpecies eſſentially different from each other. It appears on the contrary, that there was originally but one individual ſpecies of men, which, after being multiplied and diffuſed over the whole ſurface of the earth, underwent divers changes, from the influence of the climate, from the difference of food, and of the mode of living, from epidemical diſtempers, as alſo from the intermixture, varied *ad infinitum*, of individuals more or leſs reſembling each other: at firſt, theſe alterations were leſs conſiderable, and confined to individuals; but, afterwards, from the continued action of the above cauſes becoming more general, more ſenſible, and more fixed, they formed varieties in the ſpecies. Theſe varieties have been, and are ſtill, perpetuated from generation to generation, in the ſame manner as certain deformities, and certain maladies, paſs from parents to their children. And in ſhort, as theſe varieties would never have been produced but by a concurrence of external and accidental cauſes, as they would never have been confirmed and rendered permanent but by time, and by the continued action of theſe cauſes, ſo it is highly probable, that in time they would in like manner gradually diſappear, or even become different from what they at preſent are, if ſuch cauſes were no longer to ſubſiſt.

CHAP. VII.

OF DOMESTIC ANIMALS—THE HORSE—THE ASS—THE OX—THE SHEEP—THE GOAT—OF THE SWINE—THE WILD BOAR, &c.

The Horſe.

THE nobleſt conqueſt ever made by man, is that of this ſpirited animal, which ſhares with him the fatigues of war, and the glory of the combat. Equally intrepid as his maſter, the horſe ſees the danger, and braves it. Inſpired at the claſh of arms, he loves it, he ſeeks it, and is animated with the ſame ardour. He feels pleaſure alſo in the chace, in tournaments, in the courſe. He is all fire, but equally tractable as courageous, does not give way to his impetuoſity, and knows how to check his inclinations. He not only ſubmits to the arm which guides him, but even ſeems to conſult the deſires of his rider; and, always obedient to the impreſſions which he receives from him, preſſes on, moves gently, or ſtops, as his rider pleaſes. The horſe is a creature which renounces his being, to exiſt only by the will of another, which he even knows how to anticipate, and execute by the promptitude and exactneſs of his movements. He feels as much as we deſire, does only what we wiſh, gives himſelf up without reſerve, and refuſes nothing, makes uſe of all his ſtrength, exerts himſelf beyond it, and even dies to obey us.

Such is the horſe, whoſe natural qualities art has improved, which from the earlieſt ages has been broken to the ſervice of man. His education commences with the loſs of his liberty, and by conſtraint it is finiſhed. The ſervitude of theſe creatures is univerſal, and ſo ancient that we rarely ſee them in their natural ſtate. They are never wholly free from all their bands, not even at the time of reſt; and if they are ſometimes ſuffered to range at liberty in the fields, they always bear about them the marks of ſervitude, and frequently the cruel marks of labour and of pain. The mouth is deformed by the wrinkles occaſioned by the bit, the flanks ſcarred with wounds, inflicted by the ſpur, the hoofs are pierced by nails, and the attitude of the body conſtrained by habitual ſhackles. Even thoſe whoſe ſervitude is the moſt gentle, who are only fed and broken for luxury and magnificence, and whoſe golden chains ſerve leſs to decorate them, than to ſatisfy the vanity of their maſter, are ſtill more diſhonoured by the elegance of their trappings, by the treſſes of their manes, by the gold and ſilk with which they are covered, than by the iron ſhoes on their feet.

Nature is more beautiful than art, and in an animated being, the freedom of its movements makes nature beautiful. Obſerve the horſes in Spaniſh America, that live wild; their gait, their running, or their leaping, ſeem neither conſtrained nor regular. Proud of their independence, they fly the preſence of man, and diſdain his care. They wander about in liberty, in immenſe meads, where they feed on the freſh productions of an eternal ſpring. Deſtitute of any fixed habitation, without any other ſhelter than a mild ſky, they breathe a purer air than thoſe that are confined in vaulted palaces. Theſe wild horſes are alſo much ſtronger, much ſwifter, and more nervous than the greater part of domeſtic horſes. They have, what nature has beſtowed upon them, ſtrength and nobleneſs. The others, only what art can give, beauty and cunning.

The natural diſpoſition of theſe animals is not ferocious, for though ſuperior in ſtrength to the greateſt part of animals, they never attack them; and if they are attacked by others, they either diſdain them or trample them under their feet. They herd together, as they are not fearful of but fond of one another. As herbs and vegetables are ſufficient for their nouriſhment, they have quite enough to ſatisfy their appetite; and as they have no reliſh for the fleſh of animals, they never make war with them, nor with themſelves. They live in peace becauſe their appetite is ſimple and moderate; and, as they have enough, there is no room for envy.

As all parts of Europe are at preſent peopled, and almoſt equally inhabited, wild horſes are no longer found there; and thoſe which we ſee in America, were originally European tame horſes, which have multiplied in the vaſt deſarts of that country. The aſtoniſhment and fear which the inhabitants of Mexico and Peru expreſſed at the ſight of horſes and their riders, convinced the Spaniards that this animal was entirely unknown in theſe countries. They therefore carried thither a great number as well for ſervice, and their particular utility, as to propagate the breed. M. de la Salle, in 1685, ſaw in the northern parts of America, near the Bay of St Louis, whole troops of theſe wild horſes feeding in the paſtures, which were ſo fierce that nobody durſt approach them. The author of the Hiſtory of the Adventures of the Buccaneeres, ſays, that in the iſland of St Domingo, horſes may ſometimes be ſeen in troops of upwards of five hundred running together, and that as ſoon as they ſee a man, they will ſtop. He adds that one of them will approach to a certain diſtance, ſnort, take flight, and then all the reſt will follow him. To catch them, they make uſe of nooſes made of ropes, which they ſpread and hang in places which they know they frequent. If they are caught by the neck they ſtrangle themſelves, unleſs the huntſman haſtes to their aſſiſtance, who inſtantly ſecures them by the body and legs, and faſtens them to trees, where they are left for two days without either food or drink. This experiment is ſufficient to begin to make them tractable, and in time they become as much ſo as if they had never been wild; and even, if by chance they ever regain their liberty, they know their maſters, and ſuffer them to catch them again without trouble.

The manners of theſe animals almoſt wholly depend on their education. From time immemorial it has been the cuſtom to ſeparate the colts from their mothers after they have ſuckled them five, ſix, or ſeven months; for experience has taught that thoſe colts which are ſuckled ten or eleven months, are not of equal value with thoſe which are weaned ſooner, though they are generally fuller of fleſh. After ſix or ſeven months ſucking, they are weaned, that they may take more ſolid nouriſhment than milk. Bran is then given them twice a day, and a little hay, of which the quantity is increaſed in proportion as they advance in age, and they are kept in the ſtable as long as they ſeem to retain any deſire to return to the mare; but when this deſire ceaſes, they are ſuffered to go out in fine weather, and led to paſture. Care, however muſt be taken not to ſuffer them to go out to paſture faſting. They muſt have bran, and be made to drink an hour before they are ſuffered to graze, and are never to be expoſed to great cold or rain. In this manner they ſpend the firſt winter. In the May following, they are not only permitted to graze every day, but are ſuffered to lie in the fields all the ſummer, and even to the end of October, only they muſt not be allowed to eat the after-graſs; for if they accuſtom themſelves much to it, they will grow diſguſted with hay, which ought however to be their principal food, during the ſecond winter, together with bran mixed with barley, or oats wetted. They are managed in this manner, letting them graze in the day time during winter, and in the night alſo during the ſummer, till they are four years old, when they are taken from the paſtures, and fed on hay. This change in food requires ſome precaution; for the firſt eight days, the colt ſhould have nothing but ſtraw, and it is proper to adminiſter ſome vermiſuge drinks, as thoſe inſects may have been generated from indigeſtion, and green food.

Great attention muſt be paid in weaning young colts, to put them into a proper ſtable, not too hot, for fear of rendering them too delicate and ſenſible to the impreſſions of the air. They ſhould frequently have freſh litter and be kept very clean, by rubbing them often down with a whiſp of ſtraw. But they ſhould not be tied up or curried till they are two years and a half, or three years old; for this gives them great pain, their ſkin being too delicate to bear it, and they would fall away inſtead of growing fat from it. Care too muſt be taken that the rack and manger are not very high, the neceſſity of raiſing their heads too high in order to reach their food, may poſſibly give a habit of carrying it in this faſhion, which would give them an aukward appearance.

At the age of three years, or three and a half, the rider ſhould begin to break them and make them tractable. They ſhould at firſt have a light eaſy ſaddle, and ought to wear it two or three hours every day, and they ſhould be accuſtomed to have a ſnaffle bit in their mouths, and to lift up their feet, on which they ſhould ſometimes receive rather ſmart ſtrokes, and if deſigned for coach or draught horſes, ſhould wear harneſs and a bridle. At firſt a curb ſhould not be uſed, they ſhould be held by a leather ſtrap, and be made to trot, on even ground, without a rider, and with only the ſaddle or harneſs on the body. When the ſaddle horſe turns eaſily, and willingly follows the perſon who holds the leather ſtrap, the rough rider ſhould mount him and diſmount again in the ſame place, without making him move, till he is four years old, becauſe, before that age, the weight of a man overloads him, but at four he ſhould be made to walk or trot, a little way at a time, with the rider on his back. When a coach horſe is accuſtomed to the harneſs, he ſhould be paired with a horſe that is thoroughly broke, putting on him a bridle, with a ſtrap paſſed through it, till he begins to be uſed to the draught. After this the coachman muſt teach him to back, having the aſſiſtance of a man before, who muſt puſh him gently back, and even give him ſome blows to make him do it. All this ſhould be done before young horſes have changed their food, for when once they are what is called corn-fed, that is, when they feed on grain and hay, as they are more vigorous, it is remarked alſo that they are leſs tractable, and more difficult to break.

The bit and the ſpur are two means made uſe of to bring them into ſubjection. The mouth does not appear formed by nature to receive any other impreſſions than that of taſte and appetite, there is, however, ſo great a ſenſibility in the mouth of a horſe, that in preference to the eyes and ears, we addreſs ourſelves to it, to make him underſtand our pleaſure. The ſmalleſt motions or preſſure of the bit, is ſufficient to inform and determine the animal; and this organ of ſenſe has no other fault than its perfection. Its too great ſenſibility muſt be managed, for if it is abuſed, the mouth of the horſe is rendered inſenſible to the impreſſion of the bit. The ſenſes of ſight, and hearing are not ſubject to ſuch a change, and could not be dulled in this manner; but, it has been found inconvenient to govern horſes by theſe organs, and it is generally true, that ſigns given them by the ſenſe of feeling have more effect on animals in general than thoſe conveyed by the eyes or ears.

Beſides, the ſituation of horſes with relation to thoſe who mount or conduct them, makes their eyes almoſt uſeleſs for this purpoſe, becauſe they ſee only ſtraight forwards. Hence they could only perceive the ſigns made to them when they turned their heads round; and although they are frequently conducted and animated by the ear, yet in fact, if they are well broken, the ſmalleſt preſſure of the thighs, or moſt trifling motion of the bit, is ſufficient to direct them. The ſpur is even uſeleſs, or at leaſt it is only made uſe of to force them to violent motions; and as through the unſkilfulneſs of the rider, it often happens that in giving the ſpur, he checks the bridle; the horſe finding himſelf excited on one ſide, and kept in on the other, only prances and capers without ſtirring out of his place.

By means of the bridle we teach horſes to hold up their heads, and place them in a proper manner, and the ſmalleſt ſign or movement of the rider is ſufficient to make the horſe ſhew all his different paces. The moſt natural is perhaps the trot, but pacing and galloping are more pleaſant for the rider, and theſe are the two paces we particularly endeavour to improve.

Though walking is the ſloweſt of all their paces, an horſe ſhould, notwithſtanding, ſtep quick, and neither take too long nor too ſhort ſteps. His carriage ſhould be eaſy, this eaſe depends much on the liberty of his ſhoulders, and is known by the manner in which he carries his head in walking. If he keep it high and ſteady, he is generally vigorous, quick, and free in his motions. When the motion of the ſhoulders is not free, the leg does not riſe enough, and the horſe is apt to ſtumble, and ſtrike his foot againſt the inequalities on the ground. When, on the other hand, the ſhoulders are more confined in their action, and the motion of the legs appears free, the horſe is ſoon fatigued, ſtumbles, and becomes uſeleſs. A horſe ſhould raiſe his ſhoulders, and his lower haunches in walking. He ſhould alſo ſupport his leg, and raiſe it high enough, but if he keep it up too long, or let it fall too ſlowly, he loſes all the advantage of his ſuppleneſs, and becomes quite heavy.

It is not ſufficient that his walk ſhould be eaſy, his ſteps muſt be alſo equal and uniform both behind and before, for if his buttocks have a ſwinging motion, whilſt he keeps up his ſhoulders, the rider is much jolted. The ſame thing happens when the horſe extends his hind leg too much, and reſts it almoſt in the ſame place in which he reſted his fore foot. Horſes with ſhort bodies are ſubject to this fault. Thoſe which croſs their legs or ſtrike them againſt each other, are not ſure footed. Thoſe again whoſe bodies are long, are the moſt eaſy for the rider, becauſe he is at a greater diſtance from the two centers of motion, the ſhoulders and haunches, and is therefore leſs ſenſible of the motion and jolting.

The uſual method of walking among quadrupedes, is to lift up one of the fore legs and one of the hind legs together. Whilſt the right fore leg is in motion, the left hind leg follows and advances at the ſame time, and this ſtep being made, the left fore leg conjointly with the right hind leg in its turn, and ſo on. As their bodies are ſupported upon four points of ſupport, which form a long ſquare, the eaſieſt manner of moving for them, is to change two of them at once in a diagonal line, in ſuch a manner, that the centre of gravity of the body of the animal, may move but little, and reſt always in the direction of the two points which are not in motion. In the three natural paces of the horſe, the walk, the trot, and the gallop, this rule of motion is always obſerved, but with ſome difference. In the walk, there are four times in the movement; if the right fore leg moves firſt, the left hind leg follows the moment after, then the left fore leg moves forward in turn, to be followed the inſtant after by the right hind leg. Thus the right fore foot reſts on the ground firſt, the left hind foot next, then the left fore foot reſts, and laſtly, the right hind foot, which makes a movement of four times, and at three intervals, of which, the firſt and laſt are ſhorter than the middle one. In the trot there are but two times in the movement; if the right fore leg goes off firſt, the left hind leg moves at the ſame time, and without any interval between the motion of the one, and the motion of the other. The left fore leg moves alſo at the ſame time with the right hind one.

In the gallop there is uſually three times; but as in this movement there is a kind of leaping, the interior parts of the horſe do not move of themſelves, but are driven away by the ſtrength of the haunches and the hinder parts. Thus, of the two fore legs, the right ought to advance more forward than the left. The left ought before hand to reſt on the ground to ſerve as a point of reſt for the ſudden jirk which he takes. Hence the left hind foot makes the firſt time of the movement, and reſts on the ground firſt; then the right hind leg is lifted up conjointly with the left fore leg, and reſt on the ground together. At length, the right fore leg, which is raiſed an inſtant after the left fore leg, and right hind one, reſts on the ground laſt, which makes the third time. Thus, in this movement of the gallop, there are three times and two intervals; and in the firſt of theſe intervals, when the movement is made with haſte, there is an inſtant when the four legs are in the air at the ſame time, and when the four ſhoes of the horſe may be ſeen at once. When the horſe has the haunches and the houghs ſupple, and moves them with agility, the movement of the gallop is more perfect, and the cadence is made in four times. He then reſts the left hind foot which ſhews the firſt time. When the right hind foot falls to the ground and ſhews the ſecond time. The left fore foot falls a moment after, ſhewing the third time; and at length the right fore foot, which reſts laſt, ſhews the fourth time.

Horſes uſually gallop on the right foot, in the ſame manner as they carry the fore right leg in walking and trotting. They alſo throw up the dirt in galloping with the right fore leg, which is more advanced than the left. The right hind leg which follows immediately the right fore one, is more advanced than the left hind leg, the whole time that the horſe continues to gallop. Hence the left leg which ſupports all the weight, and which forces forwards the others, is more tired; for this reaſon it would be right to exerciſe horſes in galloping alternately on the left foot, as well as on the right; and they would conſequently bear much longer this violent motion.

In walking, the legs of the horſe are lifted up only a ſmall height, and the feet almoſt ſcrape the ground. In trotting they are raiſed higher, and the feet are entirely free from the ground. In galloping the legs are lifted up ſtill higher, and the feet ſeem to rebound from the earth. The walk to be good ſhould be quick, eaſy, light, and ſure. The trot ſhould be firm, quick, and equally ſuſtained. In this place, the horſe ſhould carry his head high, and his back ſtraight; for, if the haunches riſe and fall alternately at each trot he takes, if the crupper moves up and down, and the horſe rocks himſelf, he trots ill. If he throws out his fore legs, it is another fault: the fore legs ſhould tread in a line with the hind ones, which ſhould always efface their tracks. When one of the hind legs is thrown forwards, if the fore leg of the ſame ſide remain in its place too long, the motion becomes more uneaſy and difficult from this reſiſtance. For this reaſon the interval between the two times of the trot ſhould be ſhort; but, be it ever ſo ſhort, this reſiſtance is ſufficient to make this pace more uneaſy than walking and galloping, becauſe in walking the motion is more eaſy, gentle, and the reſiſtance leſs; and in galloping there is ſcarcely any horizontal reſiſtance, which is the only one inconvenient for the rider.

Walking, trotting, and galloping, are the moſt uſual natural paces. Some horſes, however, have another natural pace, called the amble, which is very different from the three others, and, at the firſt glance appears contrary to the laws of mechanics. In this pace the foot of the horſe grazes the ground ſtill more than in walking, and each ſtep is much longer. But the moſt remarkable circumſtance is, that the two legs on the ſame ſide, ſet off at the ſame time to make a ſtep, and afterwards the two other legs move at the ſame time to make another, ſo that each ſide of the body alternately is without ſupport, and there is no equilibrium maintained between the one or the other. It is therefore only from his almoſt grazing the earth, and the quick alternate motion, that he can ſupport himſelf in this pace. There is in the amble, as well as in the trot, but two times in the motion; and all the difference is, that in the trot the two legs which go together are oppoſite, in a diagonal line: inſtead of which, in the amble, the legs on the ſame ſide go together. This pace, is very eaſy for the rider, as it has not the jolting of the trot, which is occaſioned from the reſiſtance the fore leg meets with when the hind leg riſes. Becauſe in the amble, the fore leg riſes at the ſame time with the hind leg on the ſame ſide; inſtead of which, in trotting the fore leg on the ſame ſide, reſts and aſſiſts the impulſe during the whole time that the hind leg is in motion.

Of all the large animals, the horſe has the greateſt proportion and elegance in every part of the body. The great length of the jaws, is the principal cauſe of the difference between the heads of quadrupedes, and of the human ſpecies. It is alſo, the moſt ignoble mark of all; yet, though the jaws of the horſe are very long, he has not, like the aſs, an air of imbecility, or of ſtupidity like the ox. The regularity of the proportions of his head, on the contrary, gives him an air of ſprightlineſs, which is well ſupported by the beauty of his cheſt. The horſe ſeems deſirous of raiſing himſelf above his ſtate of a quadruped, by holding up his head, and in this noble attitude he looks man in his face. His eyes are lively and large, his ears well made, and of a juſt proportion, without being ſhort like thoſe of the bull, or too long like thoſe of the aſs. His mane ſuits well his head, ornaments his neck, and gives him an air of ſuperiority. His long buſhy tail covers, and terminates advantageouſly the extremities of his body, far different from the ſhort tails of the ſtag, the elephant, &c. and the naked tails of the aſs, the camel, the rhinoceros, &c. The tail of the horſe is formed of long, thick hair, which ſeems to come from his rump. He cannot raiſe his tail like the lion, but it ſuits him better hanging down, as he can move it ſideways. It is very uſeful to him to drive away the flies which incommode him, for though his ſkin is very hard, and is every where furniſhed with a cloſe thick coat it is extremely ſenſible.

The head of a well proportioned horſe ſhould be lean and ſmall, without being too long. The ears ſhould be at a moderate diſtance, ſmall, ſtraight, immoveable, narrow, thin, and well-placed on the top of the head. The forehead ſhould be narrow, and a little convex. Hollows ſhould be filled up, the eye-lids thin, the eyes clear, lively, full of fire, rather large, and projecting from the head, the pupil large, the nether jaw thin, the noſe a little aquiline, the noſtrils large and open, the partition of the noſe, and the lips thin. The mouth ought to be of a moderate width, the withers raiſed and ſlopping, the ſhoulders thin, flat, and not confined, the back equal, even, and inſenſibly arched lengthways, and raiſed on each ſide of the ſpine, which ſhould appear indented. Flanks ſhould be full and ſhort, the rump round and fleſhy, the haunches well covered with hair, the ſtump of the tail thick and firm, the fore-legs and thighs thick and fleſhy, the knee round before, the houghs large and rounded, the ſinew looſe, the joint next the foot ſmall, the fetlock not thickly covered with hair. The paſtern ought to be large, and of a middling length, the coronet rather raiſed, the hoof black, ſmooth, ſhining, and high, the quarters round, the heels wide and moderately raiſed, the frog ſmall and thin, and the ſole thick and hollow.

But there are few horſes in which this aſſemblage of perfection is to be found. The eyes are ſubject to many complaints, which are ſometimes difficult to be known. In a healthy eye, we ought to ſee through the cornea two or three ſpots of the colour of ſoot, above the pupil. To ſee theſe ſpots, the cornea muſt be clear, clean, and tranſparent; if it appears double, or of a bad colour, the eye is not good. A ſmall, long, and ſtraight pupil, encompaſſed with a white circle, is alſo a bad ſign; and when it is of a blueiſh-green colour, the eye is certainly bad and the ſight dull.

I ſhall at preſent only add ſome remarks, from which, as well as from the preceding, a judgment may be formed of the principal perfections or imperfections of an horſe. It is very eaſy to judge of the natural and actual ſtate of the animal by the motion of his ears. When he walks, he ſhould project forwards the points of his ears. A jaded horſe carries his ears low; thoſe which are ſpirited and miſchievous, alternately carry one of their ears forwards and one backwards. They all carry their ears on that ſide from which they hear any noiſe, and when any one ſtrikes them on the back, or on the rump, they turn their ears back. Horſes which have the eyes deep ſunk in the head, or one ſmaller than the other, have uſually a bad ſight. Thoſe which have the mouth dry, are not of ſo healthy a temperament as thoſe which have the mouth moiſt, and make the bridle frothy. A ſaddle horſe ought to have the ſhoulders flat, moveable, and not very fleſhy. The draft horſe, on the contrary, ſhould have them flat, round, and brawny. If, notwithſtanding, the ſhoulders of a ſaddle horſe are too thin, it is a defect which ſhews the ſhoulders are not free, and conſequently the horſe cannot bear fatigue. Another fault of a ſaddle horſe is, to have the cheſt project too far forward, and the fore legs drawn too much back, becauſe he is apt to reſt on the hand in galloping, and even to ſtumble and fall. The length of the legs ſhould be proportionable to the height of the horſe; when the fore legs are too long he is not ſure footed, if they are too ſhort, he is too heavy in the hand. It is remarked that mares are more liable than horſes to be ſhort-legged, and that horſes in general have the legs thicker than mare or geldings.

The age of the horſe is known from his teeth. He has forty; twenty-four grinders, four eye teeth, and twelve inciſive teeth. Mares have no eye teeth, or if they have them they are very ſhort. The grinders are not inſtrumental to the knowledge of their age, we form our judgment from the front and eye teeth. The twelve front teeth begin to ſhew themſelves fifteen days after the birth of the foal, theſe firſt teeth are round, ſhort, weak, and drop out at different times in order to make room for others. At two years and a half the four front middle teeth drop out the firſt, two at top and two at bottom; a year after four others fall out, one on each ſide of thoſe which are already replaced. At about four years and a half, four others drop out, always on the ſide of thoſe which have been replaced, theſe four laſt milk teeth are replaced by four others, which do not grow near ſo faſt as theſe which replaced the firſt eight; and theſe four laſt teeth which are called the wedges, and which replace the four laſt milk teeth, are thoſe by which we know the age of an horſe. Theſe are eaſily known, ſince they are third as well at top as at bottom, beginning to count from the middle of the extremity of the jaw. Theſe teeth are hollow and have a black mark in their concavity. At four years and a half, or five years old, they ſcarcely project beyond the gums, and the hollow is plainly ſeen. At ſix and a half it begins to fill up, the mark alſo begins to diminiſh and grow narrower, and ſo continues till ſeven years and a half or eight years, when the hollow is entirely filled up and the black mark effaced. After the animal has attained eight years, as theſe teeth do not give further information of the age, we generally judge by the eye teeth or tuſks. Theſe four teeth are placed at the ſide of thoſe which I have juſt now taken notice of. The eye teeth, as well as the grinders, are not preceded by others which fall out, thoſe of the inferior jaw uſually come out firſt at three years and a half, and the two of the upper jaw at four years, and till they are ſix years old they are very ſharp. At ten years old the upper ones appear already blunt, worn and long, becauſe they are bare, the gum wearing away with age, and the more they are worn away the more aged the horſe is. From ten till thirteen or fourteen years, there is hardly any indication of the age, but then ſome hairs on the eye-brows begin to grow white; but this indication is equivocal, ſince it has been remarked that horſes engendered from old ſtallions and old mares have the hair white on the eye brows at ten years old. There are alſo horſes whoſe teeth are ſo hard that they do not wear, and upon which the black mark ſubſiſts, and is never effaced; and others which have the mark in the mouth as long as they live. We may alſo know, though with leſs preciſion, the age of a horſe by the ridges of the palate, which are effaced in proportion to his age.

It has been remarked, that ſtuds kept in dry and light countries produce good tempered, ſwift, and vigorous horſes, with nervous legs and hard hoofs; while on the other hand, thoſe which are bred in damp places, and in fat paſturage, have generally the head large and heavy, the legs thick, the hoofs ſoft, and the feet flat. This difference ariſes from the climate and food, but, what is more difficult to be accounted for, and what is ſtill more eſſential than any thing that has been ſaid, is, the neceſſity of always croſſing or mixing the breed, if we would prevent their degenerating.

Mares, uſually go with ſoal eleven months and ſome days; they will breed commonly to the age of fourteen or fifteen years and the more vigorous till they are above eighteen years.

The duration of the life of horſes, is like that of every other ſpecies of animals, in proportion to the length of the time of their growth. Man, who is above fourteen years in growing, lives ſix or ſeven times as long, that is ninety or a hundred years. The horſe, who attains his full growth in four years, lives ſix or ſeven times as long, that is twenty five or thirty years. There are ſo few examples to contradict this rule, that we ſhould not even regard them as exceptions from which we may draw any precedents. It is worthy of remark too that as robuſt horſes arrive at their full growth in leſs time than delicate ones, they alſo live leſs time, and at fifteen years of age are old.

The Arabian horſes are the handſomeſt known in Europe, they are larger and plumper than thoſe of Barbary, and equally well-ſhaped, but as they are not often brought into this country, riding-maſters are not able to give an exact account of their perfections and defects.

The horſes of Barbary are more common. They are frequently negligent in their paces, and muſt be often reminded. They are very ſwift and ſtrong, light, and fit for hunting. Theſe horſes ſeem the moſt proper to breed from; it were only to be wiſhed that they were larger, as they ſeldom exceed four feet eight inches high.

The Turkiſh horſes are not ſo well-proportioned as thoſe of Barbary. They will, however, travel a great way, and are long winded. This is not ſurpriſing, if we conſider, that in warm countries, the bones of animals are harder than in cold climates; and it is for this reaſon, that they have more ſtrength in the legs.

The Spaniſh horſes, hold the ſecond rank after thoſe of Barbary. Thoſe of a handſome breed are plump, well-coated, and low. Their movements are likewiſe quick and ſupple, and they are remarkable for ſpirit and boldneſs. Their hair is uſually black, or of a bay cheſnut colour, though there are ſome of all colours, and it is but ſeldom that they have white legs and noſes. The Spaniards, who have an averſion to theſe marks, never breed from horſes that have them, chuſing only a ſtar in their forehead.

The handſomeſt Engliſh horſes have in their conformation great reſemblance to thoſe of Arabia and Barbary, from which they originally ſprung. They are frequently five feet high; and above. They are of all colours, and have all kinds of marks; they are generally ſtrong, vigorous, bold, capable of great fatigue, and excellent for hunting and courſing.

The horſes of Italy were formerly much handſomer than they are at preſent, becauſe the breed for ſome time has been neglected. Notwithſtanding this, there are ſtill ſome handſome Neapolitan horſes, eſpecially draught ones; but, in general, they have the head large, and the cheſt thick. They are untractable, and, conſequently, not eaſily managed;

naged; but theſe defects are compenſated by their noble form, their ſtatelineſs, and the beauty of their motions.

The Daniſh horſes are ſo handſome in their form, and ſo beautiful in their coats, that they are preferred to all others for putting into carriages. They are of all colours, and even of ſome ſingular ones, as pied. Horſes however ſpotted like tygers are found no where but in Denmark.

In Germany we meet with very handſome horſes; but they are generally heavy and ſhort-breathed. The Huſſars and Hungarians ſplit their noſtrils, in order, they ſay, to give them more breath, and alſo to hinder their neighing in battle. The Flemiſh horſes are greatly inferior to thoſe of Holland: they have almoſt all large heads, flat feet, and are ſubject to humours in the eyes; and theſe two laſt are eſſential defects in coach-horſes.

According to Marmol, the Arabian horſes are deſcended from the wild horſes of the deſarts of Arabia, of which, in ancient times, large ſtuds were formed, which have multiplied ſo much, that all Aſia and Africa are full of them. They are ſo nimble, that ſome will outſtrip the very oſtriches in their courſe. The Arabians of the deſart, and the people of Lybia, breed a great number of theſe horſes for hunting, but they neither uſe them in travelling nor in their wars; they ſend them to paſture whilſt there is graſs for them; and when that fails, they feed them only with dates and camel's milk, which make them nervous, nimble and lean. They lay ſnares for the wild horſes, and eat the fleſh of the young ones, which they affirm to be very delicate food. Theſe wild horſes are ſmaller than the tame ones, and are commonly aſh coloured, though there are alſo ſome white ones, and the mane and the hair of the tail is ſhort and frizzled.

Let an Arabian be ever ſo poor, he has horſes. They uſually mount the mares, experience having taught them that they bear fatigue, hunger, and thirſt, better than horſes. The Turks, on the contrary, do not approve of mares; and the Arabians ſell them the horſes which they do not keep for ſtallions. They have long preſerved, with great care, the breed of their horſes; they know all their genealogy, and diſtinguiſh the breeds by different names. The loweſt price for a mare of the firſt claſs, is from one hundred, to two or three hundred pounds ſterling. As the Arabians have only a tent for their houſe, it ſerves them alſo for a ſtable. The mare, colt, huſband, wife and children, lie promiſcuouſly together; and the little children will lie on the body and neck of the mare and colt, without being in the leaſt injured. Theſe mares are ſo accuſtomed to live in this familiarity, that they will ſuffer any kind of play. The Arabians treat them kindly, talk and reaſon with them, and take great care of them, always let them walk, and never uſe the ſpur without neceſſity. Hence, as ſoon as they feel their flank tickled with the ſtirrup-iron, they ſet out immediately with incredible ſwiftneſs, and leap hedges and ditches, with as much agility as ſo many does. But if their rider happen to fall, they are ſo well trained, that they will ſtop ſhort even in the moſt rapid gallop. All Arabian horſes are of a middling ſize, very eaſy in their manner, and rather thin than fat. They are dreſſed morning and evening regularly, with ſo much care, that not the ſmalleſt ſpot is left on their ſkins. Their legs, mane and tail, are alſo waſhed, which are let grow long, and ſeldom combed, to avoid breaking the hairs. They have nothing given them to eat all day, and ſeldom are allowed to drink above two or three times. At ſunſet, a bag is faſtened round their heads, in which is about half a buſhel of very clean barley. Theſe horſes, therefore, eat only during the night; and the bag is not taken from them till the next morning, when all is eaten up; and, in the month of March, when the graſs is tolerably high, they are turned out to paſture. As ſoon as the ſpring is paſt, they are taken again from paſture, and have neither graſs nor oats all the reſt of the year, and ſtraw but ſeldom, barley being their only food. They do not neglect to cut the mane of the colts as ſoon as they are a year or eighteen months old, in order to make it grow thick and long. They mount them at two years old, or two years and a half at moſt. Till this age they put neither ſaddle nor bridle on them; but after it, all the Arabian horſes ſtand ſaddled at the door of the tent, every day, from morning to night.

The breed of theſe horſes is diſperſed in Barbary, among the Moors, and even among the Negroes of the river Gambia and Senegal. The principal people of the country have ſome which are of uncommon beauty. Inſtead of barley or oats, they give them maize reduced to flour, which they mix with milk, when they are inclined to fatten them; and in this hot climate they ſeldom let them drink.

The Tartars live with their horſes nearly in the ſame manner as the Arabians do. When they are about ſeven or eight months old, the young children mount them, and make them walk and gallop a little way by turns. They thus break them by degrees, and oblige them to ſubmit to long faſtings; but they never mount them for racing or hunting till they are ſix or ſeven years old, and then make them ſupport incredible fatigue, ſuch as travelling two or three days together without ſtopping, paſſing four or five without any other food than a handful of graſs every eight hours. They alſo inure them to go twenty-four without drinking. Theſe horſes, which appear, and which are actually, ſo robuſt in their own country, become enfeebled and are ſoon good for nothing, when tranſported to China or the Indies; but they ſucceed better in Perſia and Turkey. In leſſer Tartary they have alſo a breed of ſmall horſes, which are in ſuch eſtimation, that they are not allowed to ſell them to foreigners. Theſe horſes have all the good and bad qualities of thoſe of great Tartary, which ſhews how much the ſame manners, and the ſame education, give the ſame diſpoſition to theſe animals. There are alſo in Circaſſia, and in Mingrelia, many horſes which are even handſomer than thoſe of Tartary. There are alſo found ſome handſome horſes in the Ukraine, Walachia, Poland and Sweden; but we have no particular account of their qualities and defects.

When the horſe is inflamed with love, deſire or appetite, he ſhews his teeth, and ſeems to laugh. He ſhews them alſo when he is angry, and would bite. He ſometimes puts out his tongue to lick, but leſs frequently than the ox, who licks much more than the horſe, and who, notwithſtanding, is leſs ſenſible to careſſes.

The horſe alſo remembers ill treatment much longer than the ox; his natural diſpoſition and courage are ſuch, that, when he finds more is expected from him than he is able to perform, he is irritated and will not exert himſelf. Inſtead of which, the ox, who is ſlow and idle, exerts himſelf, and is more eaſily tired.

The horſe ſleeps much leſs than man; for when he is in health, he does not reſt more than two or three hours together. He then gets up to eat; and when he is ſatisfied, he lies down a ſecond time; but he does not ſleep more than three or four hours in the twenty-four. There are even ſome horſes who never lie down, but ſleep ſtanding. It has alſo been remarked, that geldings ſleep oftener and longer than horſes.

Quadrupeds do not all drink in the ſame manner, though they are all equally obliged to ſeek with the head for the liquor, except the monkey, macaw, and ſome others that have hands, and conſequently drink like men, when a vaſe or glaſs is given them which they can hold. They carry this to their mouths, inclining the head, throwing down the liquor, and ſwallowing it by the ſimple motion of deglutition. Man uſually drinks in the ſame manner, becauſe it is moſt convenient. Moſt quadrupeds alſo chuſe that mode which is moſt agreeable to them, and conſtantly follow it. The dog, whoſe mouth is large, and whoſe tongue is long and thin, drinks lapping, which mode he prefers to that of wetting the noſe. The horſe, on the contrary, whoſe mouth is ſmall, and whoſe tongue is too ſhort and thick to ſcoop it up, and who always drinks with more avidity than he eats, dips the mouth and noſe quickly and deeply into the water, which he ſwallows largely by the ſimple motion of deglutition. This however forces him to drink without breathing; whilſt the dog breathes at his eaſe while he is drinking. Horſes therefore ſhould be ſuffered to take ſeveral draughts, eſpecially after running, when reſpiration is ſhort and quick. They ſhould not however, be ſuffered to drink the water too cold, becauſe that, independently of the cholic, which cold water frequently occaſions, it ſometimes happens alſo, from the neceſſity they are in of dipping the noſe into the water, that they catch cold, which often lays the foundation of a diſorder called the glanders, the moſt formidable of all to the horſe. As the ſeat of the glanders is in the pituitary membrane, it is conſequently a real cold, which occaſions an inflammation in this membrane. Travellers too, who give us a detail of the maladies of horſes in warm climates, as in Arabia, Perſia, and Barbary, do not ſay that the glanders are ſo frequent there as in cold climates. It is from this therefore that the conjecture ariſes, that this malady is occaſioned by the coldneſs of the water, becauſe theſe animals are obliged to dip and keep the noſe and noſtrils a conſiderable time under it. This, however, might be prevented by never giving it to them cold, and by always wiping the noſtrils after drinking. Aſſes, who fear the cold more than horſes, and who reſemble them ſo ſtrongly in the interior ſtructure, are, notwithſtanding, not ſo ſubject to the glanders. This may poſſibly happen from their drinking in a different manner from horſes; for, inſtead of dipping the mouth and noſe deeply into the water, they ſcarcely touch it with their lips.

I ſhall not ſpeak of the other diſeaſes of horſes. It would extend this Natural Hiſtory too much to join to the hiſtory of an animal that of its diſorders: nevertheleſs, I cannot leave the hiſtory of the horſe, without regretting that the health of this uſeful animal ſhould have been hitherto abandoned to the care, and too frequently abſurd practice, of ignorant people. The branch of phyſic which the ancients called Veterinarian, is at preſent ſcarcely known but by name. Were ſome phyſician to direct his views this way, and make this ſtudy his principal object, he would ſoon find it anſwer his purpoſe, both with reſpect to reputation and profit. Inſtead of degrading himſelf, he would render his name illuſtrious; and this branch of phyſic would not be ſo conjectural and difficult as the other. All cauſes being more ſimple in animals than in man, the diſeaſes ought alſo to be leſs complicated, and conſequently treated with more ſucceſs. Without mentioning the entire liberty he would have of making experiments and finding out new remedies, and the ability of arriving without fear or reproach at a great extent of knowledge of this kind, from which, by analogy, inferences might alſo be drawn ſalutary even to mankind.

The Aſs.

If we conſider this animal with attention, he appears only to be a horſe degenerated. The perfect ſimilitude in the conformation of the brain, the lungs, the ſtomach, the inteſtinal conduit, the heart, the liver, and other viſcera, and the great reſemblance of the body, legs, feet, end the entire ſkeleton, is a ſufficient foundation for this opinion. We may even attribute theſe ſlight differences which are found between theſe two animals, to the influence of the climate, food, and the fortuitous ſucceſſion of many generations of ſmall wild horſes, half degenerated, which, by little, have ſtill continued to degenerate ſo far as at laſt to produce a new and fixed ſpecies; or rather, a ſucceſſion of individuals, all vitiated in the ſame manner. What appears to favour this notion, is, that as horſes vary much more than aſſes in the colour of their ſkin, they are conſequently more anciently domeſtic, ſince all domeſtic animals vary much more in their colour than wild ones of the ſame ſpecies. Beſides the greater number of wild horſes, of which travellers ſpeak, are ſmall in their ſize, and have, like aſſes, the coat grey, and the tail naked and frizzled at the end. They alſo mention wild horſes, and even domeſtic ones, which have a black ſtripe on the back, and other marks, which nearly reſemble both wild and domeſtic aſſes.

Again if we conſider the difference of the temperament, diſpoſition, the manners, the organiſm, of theſe two animals, and, above all, the impoſſibility of mixing the breed to make one common ſpecies, or even an intermediate ſpecies which may be renewed, it appears a better-founded opinion, to think that theſe animals are of a ſpecies equally ancient, and originally as different as they are at preſent. The aſs differs materially from the horſe, in the ſmallneſs of the ſize, largeneſs of the head, length of the ears, hardneſs of the ſkin, nakedneſs of the tail, the form of the rump, and alſo in the dimenſions of the neighbouring parts; ſuch as the voice, the appetite, manner of drinking, &c. Do the horſe and the aſs, then, come originally from the ſame ſtock? are they of the ſame family, or not? and have they not always been different animals?

When two individuals cannot produce together, we can no otherwiſe account for it, but from ſlight difference in their temperament, or ſome accidental fault in the organs of generation, of one or the other of theſe two individuals. That two individuals of different ſpecies, ſhould produce other individuals which do not reſemble the one or the other in any fixed particular, and can conſequently produce nothing like themſelves, there needs but a certain degree of conformity between the form of the body and the organs of generation of theſe different animals. But what an immenſe number of combinations are neceſſary, even to ſuppoſe that two animals, male, and female, of a certain ſpecies, are no longer able to produce with thoſe of their own kind, but are even degenerated to ſuch a degree that they can only produce together; and alſo, what a prodigious immenſity of combinations are neceſſary that the production of theſe two degenerated animals ſhould follow exactly the ſame laws which are obſerved in the production of perfect animals; for a degenenerated animal is itſelf a vitiated production; and how can a vitiated, depraved origin, become a ſtock, and not only produce a conſtant ſucceſſion of beings, but even produce them in the ſame manner, and following the ſame laws, which in effect reproduce the animal, the origin of which is pure?

Although we cannot demonſtrate that the production of a ſpecies, by degeneration, is a thing impoſſible in nature, yet the number of probabilities on the contrary is ſo great, that we can no longer doubt of it. For if ſome ſpecies have been produced by the degeneration of others, if the ſpecies of the aſs is derived from the ſpecies of the horſe, this can only have happened ſucceſſively. By degrees, therefore, there would have been, between the horſe and the aſs, a great number of intermediate animals, the firſt of which would have differed but ſlightly in its nature from the horſe, and the latter would have approached by degrees to that of the aſs. Why then do we not ſee the repreſentatives, the deſcendants of the intermediate ſpecies? why do only the two extremes remain?

The aſs is then an aſs, and not a horſe degenerated. He is neither a ſtranger, an intruder, nor a baſtard. He has, his family, his ſpecies, and his rank. His blood is pure; and although his nobility is leſs illuſtrious, yet it is equally good, equally ancient with that of the horſe. Why, then, have we ſo much contempt for this animal; ſo good, ſo patient, ſo ſteady, ſo uſeful? Do men carry their contempt even to animals, thoſe which ſerve them ſo well, and at ſo ſmall an expence? We take care of, we inſtruct, and we exerciſe the horſe, whilſt the aſs is abandoned to the care of the loweſt ſervant, or the tricks of children. Thus inſtead of improving, he muſt looſe by his education; and if there were not a fund of good qualities, he would certainly loſe them by the manner in which he is treated. He is the May game of the ruſticks, who beat him with ſtaffs, overload him, and make him work beyond his ſtrength. We do not conſider, that he would be the moſt beautiful, the beſt-formed, and moſt diſtinguiſhed of the lower animals, if there were no horſe in the world. We forget that he is an aſs, that he has all the qualities of his nature, all the gifts attached to his ſpecies; and at the ſame time, we only think of the figure and qualities of the horſe, which he ought not to have.

He is naturally as humble, patient, and quiet, as the horſe is proud, ardent, and impetuous. He ſuffers with conſtancy, and perhaps with courage, chaſtiſement and blows. He is moderate both as to the quantity and quality of his food. He is contented with the hardeſt and moſt diſagreeable herbs, which the horſe, and other animals, will leave with diſdain. He is very delicate with reſpect to his water, for he will drink none but the cleareſt, and from rivulets which he is acquainted with.

He drinks as moderately as he eats, and does not put his noſe in the water (through fear, as ſome ſay, of the ſhadow of his ears.) As care is not taken to curry-comb him, he frequently rolls himſelf on the graſs, thiſtles, and in the duſt; and, without regarding his load, he lays himſelf down to roll about as often as he can, and by this ſeems to reproach his maſter, for the little care he takes of him.

In his earlieſt youth, he is ſprightly, and even handſome, light and genteel; but, either from age or bad treatment, he ſoon loſes it, and becomes ſlow, indocile and headſtrong. Pliny aſſures us, that, when they ſeperate the mother from the young one, ſhe will go through fire to recover it. The aſs is alſo ſtrongly attached to his maſter, notwithſtanding he is uſually ill-treated. He will ſmell him afar off, and can diſtinguiſh him from all other men. He alſo knows the places where he has lived, and the ways which he has frequented. His eyes are good, and his ſmell is acute. His ears are excellent, which has alſo contributed to his being numbered among timid animals, which it is pretended have all the hearing extremely delicate, and the ears long. When he is overloaded, he ſhews it by lowering his head, and bending down his ears: when he is greatly abuſed, he opens his mouth, and draws back his lips in a moſt diſagreeable manner, which gives him an air of deriſion and ſcorn. If his eyes are covered over, he remains motionleſs. He walks, trots, and gallops like the horſe; but all his motions are ſmaller, and much ſlower. Notwithſtanding he can run with tolerable ſwiftneſs, he can gallop but a little way, and whatever paces he uſes, if he is hard preſſed, he is ſoon fatigued.

The Jack-aſs brays in a very diſcordant manner. The ſhe-aſs has a clearer and ſhriller voice. Thoſe that are gelded, bray very low; and, though they ſeem to make the ſame efforts, and the ſame motions of the throat, yet their cry cannot be heard far off.

Of all the animals covered with hair, the aſs is leaſt ſubject to vermin. This circumſtance may be attributed to the hardneſs and dryneſs of the ſkin, which is certainly harder than in the greateſt part of other quadrupeds. He is much leſs ſenſible than the horſe too to the whip and the ſting of the flies.

At two years and a half old, the firſt middle inciſive teeth fall out, and afterwards the other inciſive at the ſide of the firſt fall alſo, and are renewed at the ſame time and in the ſame order as thoſe of the horſe. The age of the aſs is alſo known by his teeth. The third inciſive on each ſide aſcertains it, as in the horſe.

The aſs is three or four years in growing, and lives twenty-five or thirty years. He ſleeps leſs than the horſe, and does not lie down to ſleep, except when quite tired.

There are among aſſes different races, as among horſes; but they are much leſs known, becanſe they have not been reared with the ſame attention; but we cannot doubt that they came all originally from warm climates. Ariſtotle aſſures us, that there were none in his time in Scythia, nor in the other neighbouring countries nor even in Gaul, which, he ſays, is a cold climate. He adds too that a cold climate either prevents them from procreating their ſpecies, or makes them to degenerate; and that this laſt circumſtance is the reaſon that they are ſmall and weak in Illyria, Thrace and Epirus. They appear to have come originally from Arabia, and to have paſſed from Arabia into Egypt, from Egypt into Greece, from Greece into Italy, from Italy into France, and afterwards into Germany, England, and laſtly into Sweden, &c. for they are, in fact, weak and ſmall in proportion to the coldneſs of the climate.

The Latins, after the Greeks, have called the wild aſs, angra; which animal muſt not be confounded, as ſome naturaliſts and many travellers have done, with the zebra. The angra, or wild aſs, is not ſtriped like the zebra, and is not near ſo elegant in figure. Wild aſſes are found in ſome of the iſlands of the Archipelago, and particularly in that of Cerigo. There are alſo many in the deſarts of Lybia and Numidia. They are grey, and run ſo faſt, that the horſes of Barbary only outſtrip them in the chace. When they ſee a man, they give a loud cry, turn themſelves about, and ſtop, and do not attempt to fly till he approaches pretty near them. They are taken in ſnares made with ropes, and go in troops both to paſturage and to drink; their fleſh is alſo eaten. There were alſo, in the time of Marmol, wild aſſes in the iſland of Sardinia, but leſs than thoſe of Africa; and Pietro della Valle ſaid, he has ſeen a wild aſs at Baſſora, whoſe figure differed in no reſpect from a domeſtic one. He was only of a lighter colour, and had, from the head to the tail, a ſtripe of white; he was alſo much livelier, and lighter in hunting, than the greater number of aſſes.

Neither aſſes nor horſes have been found in America, although the climate, eſpecially of North America, is as good for them as any other. Thoſe which the Spaniards have tranſported from Europe, and which they have left in the Weſt-Indies, and on the Continent, have greatly multiplied; and in ſome parts wild aſſes are found in troops, and are taken in ſnares like wild horſes.

The aſs with the mare produces large mules, and the horſe with the ſhe-aſs produces ſmall mules, differing from the firſt in many reſpects.

As wild aſſes are unknown in theſe climates, we cannot actually ſay whether the fleſh is good to eat; but it is certain, that the fleſh of the domeſtic aſs is extremely bad, and harder than that of the horſe. The milk of the aſs, on the contrary, is an approved and ſpecific remedy for certain complaints, and its uſe is known from the Greeks to us. That it may be good in its kind, we ſhould chuſe a young healthy ſhe-aſs, full of fleſh, that has lately foaled, and which has not ſince that period been with the male. Care muſt be taken to feed her well with hay, wheat, and graſs. The milk muſt not be expoſed to the air, which will ſpoil it in a ſhort while.

The ſkin of the aſs is uſed for different purpoſes, ſuch as to make drums, ſhoes, and thick parchment for pocket-books, which is ſlightly varniſhed over. It is alſo with the ſkins of aſſes that the Orientals make the ſagri, which we call ſhagreen.

The aſs is, perhaps, the animal which can carry the greateſt weight. As it coſts but little to feed him, and as he ſcarcely requires any care, he is of great uſe in the country. He alſo ſerves to ride on, as all his paces are gentle, and he ſtumbles leſs than the horſe. He is frequently put to the plough in countries where the earth is light, and his dung is an excellent manure.

*The Ox.**

The ox, and other herbiverous animals are not only the moſt uſeful to man, but they are alſo maintained at the leaſt expence. The ox is the moſt excellent in this reſpect, for he reſtores as much to the earth as he takes from it, and even enriches the ground on which he feeds.

That the ox is not ſo proper as the horſe, the aſs, and the camel, for carrying burthens, the form of his back and loins, is a demonſtration. But the thickneſs of his neck, and the broadneſs of his ſhoulders point him out as deſtined for the yoke.

In ſome places they make him draw by the horns. In ſupport of this practice, it is alledged that when yoked in this manner he is more eaſily managed. His head is very ſtrong, and he draws well by the horns, but with much leſs advantage than by the ſhoulders. Nature ſeems to have deſtined him for the plough. The ſize of his body, the ſlowneſs of his motions, the ſhortneſs of his legs, and even his tranquillity and patience when he labours, ſeem to concur in rendering him proper for the cultivation of the fields, and more capable than any other of overcoming the conſtant reſiſtance that the earth oppoſes to his efforts.

In thoſe ſpecies of animals, which man has formed into flocks, and where the multiplication is the principal object, the female is more uſeful than the male. The produce of the cow is renewed every inſtant. The fleſh of the calf is wholeſome and delicate. The milk is the food of children; butter reliſhes the moſt of our diſhes, and cheeſe is the common food of the peaſants.

The cow arrives at the age of puberty in eighteen months, and the bull in two years. But they ſhould not be admitted to each other till they be three years old. From three to nine years theſe animals are in their greateſt vigour. After this, neither cows nor bulls are fit for any thing but to fatten for the ſlaughter, as at two years of age they are almoſt at their full growth. The length of their lives is alſo, like that of the greateſt part of the other ſpecies of animals, about fourteen years, and they ſeldom live above fifteen.

The dulleſt and moſt idle animals are not thoſe which ſleep the ſoundeſt, or the longeſt. The ox ſleeps, but his ſleep is ſhort, and not very ſound; for he awakes at the leaſt noiſe. He uſually lies on his left ſide, and that kidney is always larger and fatter than the kidney on the right ſide.

Oxen like other domeſtic animals, differ in colour; but at the ſame time red appears to be the moſt common, and the redder they are, the more they are eſteemed. It is ſaid, that oxen of a bay colour laſt longeſt; that thoſe of a brown colour are ſooner fatigued, and ſhorter lived; that the grey, brindled, and white are not proper for work, and are only fit to be fatted for ſlaughter. But whatever colour the coat of the ox is of, it ſhould be ſhining, thick, and ſoft to the touch; for if it is rough and uneven, we have reaſon to think that the animal is not well, or at leaſt, that he is not of a ſtrong conſtitution.

The ox ſhould only be worked from three years old to ten; and it is proper then to take him from the plough, in order to fatten and ſell him, as the fleſh will be better than if he be kept longer. The age of

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* The word Ox, in its common acceptation, denotes Black Cattle in general without regard to ſex. In a more reſtricted ſenſe, it ſignifies a caſtrated Bull.

this animal is known by his teeth and horns. The firſt front teeth fall out when he is ten months old, and are replaced by others which are larger and not ſo white. At ſixteen months thoſe on each ſide of the middle teeth drop out, and are replaced by others; and at three years old, all the inciſive teeth are renewed. They are then all long, white, and even; and, in proportion as the ox advances in years, they decay, and become unequal and black. The horns fall off at three years, and theſe are replaced by other horns, which, like the ſecond teeth, do not fall off a ſecond time. Thoſe of the ox and the cow grow larger and longer than thoſe of the bull; but the growth of theſe ſecond horns is not uniform. The fourth year of the age of the ox, two little pointed horns ſprout, which are even, and terminate at the head by a kind of knob. The following year this knob grows from the head, puſhed out by a cylinder of horn, which forms and terminates alſo by another knob; for as long as the animal lives, the horns grow. Theſe knobs become annular knobs, which are eaſily to be diſtinguiſhed in the horns, and by which alſo the age may be eaſily known, by reckoning three years for the firſt knob next the point of the horn, and one year more for each of the intervals between the other knobs.

The horſe eats night and day, ſlowly, but almoſt continually. The ox, on the contrary, eats quick, and takes in a ſhort time all the food which he requires; after which he ceaſes to eat, and lies down to ruminate. This difference ariſes from the different conformation of the ſtomachs of theſe animals. The ox, of whoſe ſtomachs the two firſt form but one bag of a vaſt capacity, can in both of them, receive graſs, at the ſame time which it afterwards ruminates and digeſts at leiſure. The horſe, whoſe ſtomach is ſmall, and can receive but a ſmall quantity of graſs, is filled ſucceſſively in proportion as he digeſts it, and it paſſes into the inteſtines, where the principal decompoſition of the food is performed.

Chewing the cud is but a vomiting without ſtraining, occaſioned by the re-action of the firſt ſtomach on the food which it contains. The ox fills the two firſt ſtomachs, the paunch, and the bag, which is but a portion of the paunch, as much as he can. This membrane acts with force on the graſs which it contains; it is chewed but a little, and its quantity is greatly increaſed by fermentation. Were the food liquid, this force of contraction would occaſion it to paſs by the third ſtomach, which only communicates with the other by a narrow conveyance, and cannot admit ſuch dry food, or, at leaſt, can only admit the moiſter parts. The food muſt, therefore, neceſſarily paſs up again into the œſophagus, the orifice of which is larger than the orifice of the conduit, and the animal again chews and macerates them, imbibes them afreſh with its ſaliva, and thus by degrees makes the aliment more moiſt. He reduces it to a paſte, liquid enough for it to enter this conduit which paſſes into the third ſtomach, where it is again macerated before it enters the fourth; and it is in this laſt ſtomach that the decompoſition of the hay is finiſhed, which is reduced to a perfect mucilage.

What chiefly confirms the truth of this explication, is, that as long as the animals ſuck, and are fed with milk and other liquid aliments, they do not chew the cud. They chew the cud much more too in winter, when they are fed with dry food, than in ſummer, when they eat tender graſs.

Good milk is neither too thick, nor too thin. Its conſiſtence ſhould be ſuch, that when we take a drop, it ſhould preſerve its roundneſs without running, and in colour it ſhould be of a beautiful white. That which is inclinable to blue or yellow is not good. Its taſte ſhould be ſweet, without any bitterneſs or ſourneſs. It is better during the month of May, and during the ſummer, than in the winter; and it is never perfectly good but when the cow is of a proper age, and in good health. The milk of young cows is too thick, that of old ones during the winter is alſo too thick. The milk of cows which are hot, is not good, any more than that of a cow which is near her time, or which has lately calved. In the third and fourth ſtomach of the calf which ſucks, there are clots of crudled milk. Theſe when dried in the air, ſerve to make runnet or that well known ſubſtance which coagulates milk. The longer the runnet is kept, the better it is, and it requires but a ſmall quantity of it to make a great deal of cheeſe.

Bulls, cows, and oxen, are apt to lick themſelves, but moſtly when they are quiet; and as it is thought that it hinders them from fattening, it is uſual to rub all the parts of their bodies they can touch with their dung. When this precaution is not taken, they raiſe up the hair of their coats with their tongues, which are very rough, and they ſwallow this hair in large quantities. As this ſubſtance cannot digeſt, it remains in the ſtomach, and forms round, ſmooth balls, which are ſometimes of ſo conſiderable a ſize, as to prevent their digeſtion. Theſe knobs in time get covered with a brown cruſt, which is ſomewhat hard. It is, notwithſtanding, but a thick mucilage, which, by rubbing and co-action becomes hard and ſhining. It is never found any where but in the paunch, and if any of the hair gets into the other ſtomachs, it does not remain but ſeems to paſs with the aliments.

Animals which have inciſive teeth, ſuch as the horſe and the aſs, in both jaws, bite ſhort graſs more eaſily than thoſe which want inciſive teeth in the upper jaw. Hence if the ſheep and the goat bite the cloſeſt, it is becauſe they are ſmall, and their lips are thin. But the ox, whoſe lips are thick, can only bite long graſs; and it is for this reaſon that they do no harm to the paſture on which they live, as they can only bite off the tops of the young graſs. They do not ſtir the roots, and for this reaſon ſcarcely hurt the growth; inſtead of which, the ſheep and the goat bite ſo cloſe, that they deſtroy the ſtalk and ſpoil the root. Beſides, the horſe chuſes the moſt delicate graſs, and leaves the largeſt to grow, the ſtalks of which are hard. The ox, on the other hand, bites theſe thick ſtalks, and by little and little deſtroys the coarſe graſs; ſo that, at the end of ſome years, the field in which the horſe has lived becomes a very bad one, whilſt that on which the ox has brouſed, becomes fine paſture.

The Sheep.

We can no longer doubt, but that animals which are actually domeſtic, were formerly wild. But man, who has conquered ſo many millions, of individuals, can he boaſt of having conquered an entire ſpecies? As they were all created without his aid, may he not alſo believe, that they all have had orders to grow without his help? If we conſider, nevertheleſs, the weakneſs and ſtupidity of the ſheep, and at the ſame time reflect, that this animal, without defence, cannot find ſafety in flight; that he has for his enemies all devouring animals, which ſeem to ſeek him in preference to any other; that formerly this ſpecies produced but few; that each individual lived but a ſhort time; we ſhall be inclined to think, that from the beginning, ſheep were intruſted to the care of man. What ſeems to give farther ſtrength to this opinion is, that there are no wild ſheep in the deſarts; that in all places where man does not rule, the lion, the tiger, and the wolf reign by force, and by cruelty; and theſe animals of blood and carnage, all live longer, and multiply much more than ſheep; and, in ſhort, that if we were now to abandon the troops of theſe ſpecies, which we have rendered ſo numerous, they would ſoon be deſtroyed before our eyes, and the ſpecies would be entirely annihilated by the voraciouſneſs of its numberleſs ſpecies of enemies.

The ſheep is indeed abſolutely without reſource, and without defence. The ram has but feeble arms; his courage is nothing but a petulance uſeleſs to himſelf, inconvenient to others, and which is deſtroyed by caſtration. The weather ſheep are ſtill more fearful than ews; it is through fear that they muſter up ſo often in troops. The ſmalleſt noiſe, to which they are unaccuſtomed, is ſufficient to make them fly, and get cloſe together. This fear is attended with the greateſt ſtupidity; for they know not how to fly the danger, nor do they even ſeem to feel the inconvenience of their ſituation. They continue wherever they are, either in rain or ſnow, whence they will not ſtir; and to oblige them to change their ſituation, they muſt have a chief, who is intruſted to walk firſt, and whom they will follow, ſtep by ſtep. This chief will remain with the reſt of the flock, without motion, in the ſame place, if he were not driven from it by the ſhepherd, or the dog which guards them, who, in fact, watches for their ſafety, defends, directs, and ſeparates them, aſſembles them together, and communicates to them motions not their own. Goats, which in many things reſemble ſheep, have much more underſtanding.

But this animal, ſo cowardly in itſelf, ſo deſtitute in ſentiment, is the moſt precious and the moſt uſeful, of animals both for the preſent, and future ſupport of man. Of itſelf, it not only ſupplies our greateſt neceſſities, but, at the ſame time furniſhes us both with food and cloathing. Without enumerating the particular advantages we have from the milk; the ſkin, and, even the bowels, and bones, and the dung of this animal evince that nature has given it nothing but what is uſeful to man.

Theſe ſimple animals, are alſo of a very weak conſtitution; for they cannot walk long: travelling weakens and exhauſts them; and when they run, they pant, and are ſoon out of breath. The great heat of the ſun is as diſagreeable to them, as too much moiſture, cold and ſnow. They are ſubject to many diſorders, the greateſt part of which are contagious; too much fat ſometimes kills them, and always prevents them from having young ones. They ſuffer a great deal in having young, have frequent abortions, and require more care than any other domeſtic animal.

At one year old, the ſheep loſe the two front teeth of the lower jaw; and almoſt every one knows that they have no inciſive teeth in the upper jaw. At eighteen months old, the two neighbouring teeth of the two firſt that fell, fall alſo; and, at three years old, they are replaced. They are then even, and tolerably white; but, in proportion as the animal becomes older, they become uneven and black. The age of the ram is alſo known by his horns, which ſhew themſelves in the firſt year, and frequently from the birth. They grow every year a ring, which is a mark round. The ſheep have generally no horns; but they have boney prominences on their heads, in the ſame part where the horns of the rams grow; there are, notwithſtanding, ſome ſheep which have two, and even four horns. Theſe ſheep are like the others; their horns are five or ſix inches long, but leſs turned than thoſe of the ram; and when there are four horns, the two exterior ones are ſhorter than the two others.

Sheep carry their young five months, and drop them at the beginning of the ſixth. They uſually produce but one lamb, and ſometimes two. In warm climates they may produce twice a year, but in cold climates they produce but once a year.

The ſheep has great plenty of milk for five or ſix months. This milk is tolerable food for children, and for poor people in the country; and they make good cheeſe with it, eſpecially when it is mixed with cow's milk.

In dry ſoils, and in high grounds, where wild thyme and other odoriferous herbs abound, the fleſh of the ſheep is of a much better quality than when it is fed in low plains and humid valleys, unleſs theſe plains are ſandy and near the ſea; for then all the herbs imbibe a ſaltneſs, and the fleſh of mutton is no where ſo good as in theſe ſalt meadows. The ſheep's milk is alſo more abundant, and of a better flavour, as nothing is more pleaſing to the taſte of theſe animals than ſalt, nothing is more ſalutary for them, when it is given them in moderation; and in ſome places, they put into the ſheep-pen a bag of ſalt, or a ſalt ſtone, which they will lick by turns.

Nothing contributes more to fatten ſheep, than to give them water in great quantity; and nothing prevents this advantage ſo much as the heat of the ſun.

We frequently find worms in the livers of animals; and in the Journal des Savans, there is a deſcription of worms found in the livers of ſheep and oxen, as alſo in the German Ephemerides. One would think that theſe ſingular worms were only found in the livers of animals which chew the cud; but Mr Daubenton has found ſome, which exactly reſemble them, in the liver of the aſs; and it is probable that they may be found in the livers of other animals. It has alſo been ſaid, that butterflies have been found in the livers of ſheep.

The operation of ſheep-ſhearing is performed once a year. In France it is performed in the month of May, after the ſheep have been well waſhed, in order to make the wool as clean as poſſible. In April it would be too cold; and if they were to wait till the months of June and July, there would not be time enough for the wool to grow during the ſummer, to preſerve them from the cold in the winter. The wool of ewes is generally better, and in greater abundance, than that of ſheep. That on the neck, and the top of the back, is the beſt. White wool is preferable to grey, brown, or black, becauſe in dying it will take any colour. For the quality, that which is ſmooth is better than that which is frizzled; it is alſo ſaid, that ſheep whoſe wool is frizzled, are not ſo healthy as others. Another conſiderable advantage may be made of ſheep, by incloſing them on the ground we wiſh to improve. The dung, the urine, and the heat of the bodies of theſe animals, will, in a little time, enrich the moſt exhauſted, cold, and infertile ground. A hundred ſheep, in one ſummer, will enrich eight acres of land for ſix years.

The ancients have ſaid, that all animals which chew the cud, have tallow; but this is only true of the ſheep and the goat; and that of the goat is more abundant, whiter, drier, firmer, and of a better quality than any other. It is for the moſt part about the loins that this ſuet is amaſſed in the greateſt quantities, and the left loin has always a larger quantity than the right. Sheep have no other fat about them but ſuet; and this matter is ſo predominent in their habit, that all the extremities of the body are edged with it; even the blood contains a conſiderable quantity.

The wool of Italy, Spain and England, is finer than that of France.

Thoſe animals with large, long tails, which are ſo common in Africa and Aſia, and to which travellers have given the name of Barbary ſheep, appear to be of a different ſpecies from our ſheep, as well as the lamb of America.

The Goat.

Though the ſpecies of animals are ſeparated from each other; yet ſome ſpecies approach ſo near to others, that ſpace is only left for a bare line of diſtinction. The aſs might almoſt replace the horſe; and, if the ſpecies of ſheep were to fail, that of the goat might ſupply the loſs. The goat like the ſheep, affords both milk and ſuet in conſiderable quantities. Her hair, though rougher than wool, ſerves, however, to make very good ſtuffs; and her ſkin is worth more than the ſkin of the ſheep. The fleſh of the young goat alſo nearly reſembles that of the lamb. Theſe auxiliary ſpecies are wilder and more robuſt than the principal ſpecies. The aſs and the goat do not require ſo much care as the horſe and the ſheep; for they every where find food to ſupport them, and brouze equally on plants of all kinds. They are leſs affected with the intemperance of the climate, and can do better without the help of man. The leſs dependence they have on us, the more they ſeem to belong to nature.

Although the goat is a diſtinct ſpecies, yet he will couple with the ſheep; but no intermediate ſpecies has been introduced between the goat and the ſheep. Theſe two ſpecies are diſtinct, remaining conſtantly ſeparated, and always at the ſame diſtance from each other, and have never been changed by this mixture, or produced any new ſtock, or new breed of intermediate animals. They have, at moſt, only produced different individuals, which has no influence on the unity of each primitive ſpecies, and which, on the contrary, confirms the truth of their different characteriſtics.

The goat has naturally more underſtanding, and can ſhift better for herſelf than the ſheep. She comes voluntarily, and is eaſily familiariſed: ſhe is ſenſible of careſſes, and capable of attachment: ſhe is alſo ſtronger, lighter, more agile, and leſs timid than the ſheep: ſhe is lively, capricious and laſcivious.

Goats are fond of ſtraying in ſolitary places, of climbing up ſteep places, of ſleeping on the tops of rocks, and on the brink of precipices.

The inconſtancy of this animal's nature is ſhewn by the irregularity of her actions; ſhe walks, ſtops ſhort, runs, jumps, advances, retreats, ſhews, then hides herſelf, or flies, and this all from caprice, or without any other determinate cauſe than her whimſical vivacity. All the ſuppleneſs of the organs, all the nerves of the body, are ſcarcely ſufficient for the petulance and rapidity of theſe motions, which are all natural to her.

That theſe animals are naturally fond of mankind, and that in uninhabited places they do not become wild, the following anecdote is a ſtriking confirmation. In 1698, an Engliſh veſſel having put into harbour at the iſle of Boneviſte, two negroes preſented themſelves on board, and offered the Engliſh as many goats as they choſe to take. At the ſurpriſe which the captain ſhewed at this offer, the negroes obſerved there were but twelve perſons in the iſland; that the goats multiplied ſo faſt, that they became troubleſome; and that, far from having any trouble in taking them, they followed them with a kind of obſtinacy, like domeſtic animals.

Goats go five months with young, and bring forth at the beginning of the ſixth month. They ſuckle the young ones for about a month or five weeks; ſo that it may be reckoned about ſix-and-twenty weeks from the time of their coupling till the time that the young kid begins to eat. The goat generally produces one kid, ſometimes two, very rarely three, and never more than four; and ſhe brings forth young, from a year or eighteen months, to ſeven years. The knobs in the horns, and their teeth, aſcertain their age. The number of teeth is not always the ſame in female goats; but they have generally fewer than the male goat, which has alſo the hair rougher, and the beard and the horns longer. Theſe animals, like oxen and ſheep, have four ſtomachs, and chew the cud. This ſpecies is more diffuſed than the ſheep, and goats like ours are found in ſeveral parts of the world, only in Guinea, and other warm countries, they are ſmaller; but in Muſcovy, and other cold climates, they are larger. The goats of Angora, and of Syria, have ears hanging down, and are of the ſame ſpecies with ours. They mix and produce together, even in our climate. The males have horns almoſt as long as the common goat; but the circumference and directions are very different. They are extended horizontally on each ſide of the head, and form ſpirals, ſomewhat like a worm. The horns of the female are ſhort, and firſt turn round backwards, then bend down, and turn round before, ſo much, that they end near the eyes; and in ſome their circumference and direction vary. The male and female goat of Angora, which I have ſeen, are ſuch as I have deſcribed; and theſe goats, like all the animals of Syria, have the hair ſo very long and thick, and fine, that ſtuffs have been made of it, almoſt as handſome and gloſſy as our ſilks. It is, in fact, what is commonly termed *mohair*.

The Hog.

I ſhall treat of the ſow, the hog of Siam, and the wild boar, at the ſame time, becauſe they form all three but one and the ſame ſpecies; one is wild, and the other two are domeſtic.

Ariſtotle firſt divided quadrupeds into beaſts with the hoof entire, thoſe with cloven feet, and the ſpecies which have claws. He allows that the hog is of an ambiguous nature; but the only reaſon he gives, is, that in Illyria ſwine are found which have hoofs, and in ſome other parts a ſpecies which have claws. This animal is alſo a kind of exception to the two general rules of nature, viz. That the larger animals are, the fewer young they produce at a birth; and that of all animals, thoſe which have claws are the moſt prolific. The hog, though in its make greatly above the middle ſize, produces more than any ſuch animal, or indeed, than any other quadruped.

To the ſingulariries we have already related, we ſhall add another, which is, that the fat of the hog is different from that of almoſt all other quadruped animals, not only in its conſiſtence and quality, but alſo in its poſition in the body of the animal. The fat of man, and of animals which have no tallow, ſuch as the dog, the horſe, &c. is mixed pretty equally with the fleſh. The tallow in the ram, goat, the ſtag, &c. is found only in the extremities of it. The fat covers the fleſh and forms a thick, diſtinct, and continued bed or layer, between the fleſh and the ſkin. The hog has this in common with the whale, and other cetaceous animals, the fat of which is only a kind of lard, nearly of the ſame conſiſtence with, but more oily than, that of the hog. This lard in cetaceous animals alſo forms beneath the ſkin a bed of many inches in thickneſs, which envelopes the fleſh.

There are only the hog, and two or three other ſpecies of animals, which have defenſive or very long canine teeth. They differ from the other teeth, by coming out at the front, and growing during their whole lives. In the elephant and ſea-cow, they are cylindrical, and ſome feet long. In the wild-boar and male hog, they are partly bent in form of a circle; and I have ſeen them from nine to ten inches in length. They are not very deep in the ſocket, and have alſo, like thoſe of the elephant, a cavity at the ſuperior extremity; but the elephant and ſea-cow have only theſe defenſive teeth in the ſuperior jaw, and even want canine teeth in the inferior jaw. The male hog and the wild boar on the other hand, have them in both jaws, and thoſe of the inferior are the moſt uſeful to this animal. Theſe are alſo the moſt dangerous; for it is with theſe lower tuſks the wild boar wounds.

Of all quadrupeds the hog appears the moſt rough and unpoliſhed. His voraciouſneſs ſeems to be owing to the inceſſant avidity he has to fill the vaſt capaciouſneſs of his ſtomach. It is the roughneſs of the hair, the hardneſs of the ſkin, and the thickneſs of the fat, which render theſe animals ſo inſenſible to blows. Mice have been known to lodge in their backs, and eat their fat and their ſkin, without their ſeeming ſenſible of it. Their other ſenſes are good; and the huntſmen know that wild boars both ſee, hear, and ſmell, at a great diſtance. In order therefore to ſurpriſe them, they wait in ſilence during the night, and place themſelves under the wind, to prevent the boars perceiving their ſmell, of which they are ſenſible at a great diſtance, and which makes them change their road immediately.

This imperfection in the ſenſes of the taſte and touch, is ſtill more increaſed by a diſtemper which is called the meazles, and which renders them almoſt abſolutely inſenſible. This diſorder proceeds in general from the coarſeneſs of their food; for the wild boar, which uſually lives on corn, fruits, acorns, and roots, is not ſubject to this diſtemper, any more than the young pig whilſt it ſucks. This is only to be prevented by keeping the domeſtic hog in a clean ſtable, and giving him plenty of wholeſome food. By theſe means his fleſh will become excellent to the taſte, and the lard firm and brittle, if he be kept for a fortnight or three weeks before he is killed, in a clean ſtable without litter, and get no food but dry corn. For this purpoſe we ſhould chuſe a ſow of about a year old, full of fleſh and fat.

The Wild Boar is hunted by dogs, or elſe taken by ſurpriſe in the night by the light of the moon. As he runs but ſlowly, leaves a ſtrong odour behind him, defends himſelf againſt the dogs, and wounds them dangerouſly, he ſhould not be hunted by dogs deſigned for the ſtag and the goat. The oldeſt only ſhould be attacked, and theſe are eaſily known by their traces. A young wild boar, of three years old, is difficult to take, becauſe he runs a great way without ſtopping. A wild boar that is older, on the other hand does not run far, ſuffers himſelf to be cloſely hunted, and is not much afraid of the dogs. In the day he uſually hides himſelf in the thickeſt and moſt unfrequented part of the wood, and in the evening and at night he goes out in queſt of food. In ſummer, when the corn is ripe, it is eaſy to ſurpriſe him, particularly among oats, where he frequents every night. As ſoon as he is killed, the huntſmen immediately cut out the teſticles, the ſmell of which is ſo ſtrong, that if five or ſix hours were to elapſe without cutting them out, all the fleſh would be infected. In an old wild boar the head only is good to eat; but, the fleſh of the young wild boar is extremely delicate.

Nobody is ignorant of the profits ariſing from the hog. His fleſh ſells for more than that of the ox, the lard for double, the blood, the bowels, the viſcera, the feet, and the tongue, when properly prepared, may all be eaten. The dung of the hog is much colder than that of other animals, and ſhould not be uſed for any but hot and dry lands. The ſkin hath its uſe, for ſieves are made of it; and brooms, bruſhes, and pencil-bruſhes are made of the hair. The fleſh of this animal takes ſalt and ſalt-petre better than any other, and will keep longer ſalted.

This ſpecies, though abundant, and greatly ſpread in Europe, in Africa, and in Aſia, was not, however, found on the Continent of the the world. They were tranſported by the Spaniards, who have carried black hogs to the Continent, and to almoſt all the large iſlands of America. They are multiplied and become wild in many places; and reſemble our wild boars, with this difference however, that the body is ſhorter, the head larger, and the ſkin thicker, and domeſtic hogs in warm climates are all black like wild boars.

The Hog of Siam reſembles the wild boar more than the common hog. One of the moſt evident ſigns of degeneration is the ears, which become much more ſupple when the animal changes into the domeſtic ſtate: in ſhort, thoſe of the domeſtic hog are not near ſo ſtiff, are much longer, and more pendant, than thoſe of the wild boar, which ſhould be regarded as the model of the ſpecies.

CHAP.

CHAP. VIII.

OF ANOTHER CLASS OF DOMESTIC ANIMALS—THE DOG—ITS VARIETIES—OF THE CAT, &c.

THE largeneſs of the make, the elegance of the form, the ſtrength of the body, the freedom of the motions, and all the exterior qualities are not the nobleſt properties in an animated being. As in mankind, underſtanding is preferred to figure, courage to ſtrength, and ſentiment to beauty; ſo the interior qualities are thoſe which we eſteem moſt in animals. It is in theſe that they differ from the automaton, it is by theſe they are raiſed above the vegetable, and made to approach nearer to ourſelves. It is their ſenſe which ennobles their being, which regulates, which enlivens it, which commands the organs, makes the members active, gives birth to deſire, and gives to matter progreſſive motion, will, and life.

The dog, independently of his beauty, vivacity, ſtrength, and ſwiftneſs, has all the interior qualities which can attract the regard of man. The tame dog comes crawling to lay at his maſter's feet his courage, ſtrength, and talents, and waits his orders to uſe them. He conſults, he interrogates, and he beſeeches. The glance of his eye is ſufficient; he underſtands the ſigns of his will. Without the vices of man, he has all the ardour of ſentiment, and, what is more, he has fidelity and conſtancy in his affections. He has no ambition, no intereſt, no deſire of revenge, no fear but that of diſpleaſing his maſter. He is all zeal, all warmth, and all obedience. More ſenſible to the remembrance of benefits than of wrongs, he ſoon forgets, or only remembers them to make his attachment the ſtronger. Far from running away, he licks the hand which is the cauſe of his pain, he only oppoſes it by his cries, and at length entirely diſarms it by his patience and ſubmiſſion.

More docile and flexible than any other animal, the dog is not only inſtructed in a ſhort time, but he even conforms himſelf to the motions, manners, and habits of thoſe who command him. He has all the manners of the houſe where he inhabits. Like the other domeſtics, he is always attentive to his maſter; and, ſtriving to anticipate the wants of his friends, he gives no attention to indifferent people. When the care of the houſe is intruſted to him during the night, he becomes ſometimes ferocious. He watches, he walks his rounds, he ſcents ſtrangers afar off; and if they happen to ſtop, or attempt to break in, he flies to oppoſe them, and by reiterated barkings, efforts, and cries of paſſion, he gives the alarm. As furious againſt men of prey as againſt devouring animals, he flies upon, wounds and tears them, and takes from them what they were endeavouring to ſteal; but, content with having conquered, he reſts himſelf on the ſpoils, will not touch it even to ſatisfy his appetite, and at once gives an example of courage, temperance, and fidelity.

Thus we may ſee of what importance this ſpecies is in the order of nature. Without the aſſiſtance of the dog, how could man have been able to tame, and reduce into ſlavery, other animals? How could he have diſcovered, hunted and deſtroyed, wild and obnoxious creatures? To keep himſelf in ſafety, and to render himſelf maſter of the living univerſe, it was neceſſary to begin by making himſelf friends among animals, in order to oppoſe them to others. The firſt art, then, of mankind, was the education of dogs, and the fruit of this art was the conqueſt and peaceable poſſeſſion of the earth.

The dog, faithful to man, will always preſerve a portion of empire, and a degree of ſuperiority over other animals. He commands them, and reigns himſelf at the head of a flock where he makes himſelf better underſtood than the voice of the ſhepherd. Safety, order, and diſcipline are the fruits of his vigilance and activity. But it is above all in war againſt thoſe animals which are his enemies, or which are independent, that his courage ſhines forth, that his underſtanding is diſplayed, and that his natural and acquired talents are united. As ſoon as the ſound of the horn, or the voice of the huntſman, has given the ſignal of an approaching war, tranſported with freſh ardour, the dog expreſſes his joy, and ſhews by his motions, and cries of impatience, his deſire to combat and to conquer. Then, in ſilence, he inveſtigates the traces of his enemy, and, by different cries, indicates the time, the diſtance, the ſpecies, and even the age, of his prey.

In deſerts, and depopulated countries, there are wild dogs which in their manner differ only from wolves by the facility with which they are tamed. They unite alſo in large troops, to hunt and attack by force wild boars and bulls, and even lions and tygers. In America, the wild dogs ſpring from a breed anciently domeſtic, having been tranſported from Europe; and having been either forgotten or abandoned in theſe deſerts, are multiplied to ſuch a degree that they go in troops to inhabited places, where they attack the cattle, and ſometimes even inſult the inhabitants. They are then obliged to drive them away by force, and to kill them like other ferocious animals; and in fact, dogs are ſuch till they become acquainted with man. When, however, we approach them with gentleneſs, they ſoon become familiar, and remain faithfully attached to their maſters. The wolf, on the other hand, although taken young, and bred in the houſe, is only gentle in his youth, for he never loſes his deſire for prey, and ſooner or later he gives himſelf up to his fondneſs for rapine and deſtruction.

The dog is the only animal whoſe fidelity may be put to the proof. He is the only one which always knows his maſter and his friends. The only one who perceives the approach of a ſtranger. The only animal, in ſhort, whoſe talents are evident, and whoſe education is always good.

Of all animals, the dog has an underſtanding moſt ſuſceptible of impreſſions, and is moſt eaſily taught by moral cauſes. He is alſo, above all other creatures, moſt ſubject to the variety and other alterations occaſioned by phyſical influences. The temperament, the faculties, and habits of dogs vary prodigiouſly, and their form is not uniform. In the ſame country, one dog is very different from another dog, and the ſpecies is quite different in itſelf in different climates.

But, what is moſt difficult to aſcertain in the numerous variety of different races, is the character of the primitive and original breed. How are we to know the effects produced by the influence of the climate, food, &c.?

Amongſt domeſtic animals, the dog is, above all others, that which is moſt attached to man. He is that in which ſentiment predominates enough to render him docile, obedient, and ſuſceptible of all impreſſions, and even of all conſtraint. It is not aſtoniſhing, therefore, that of all animals this ſhould alſo be that in which we find the greateſt variety, not only in figure, in height, and in colour, but in every other quality.

There are alſo ſome circumſtances, which concur to this change. The dog in general lives but a ſhort time; it produces frequently, and in pretty large numbers; and as it is perpetually beneath the eyes of man, as ſoon as by a chance uſual to nature, there may have been found among ſome individuals, ſingularities, or apparent varieties, endeavours may have been uſed in order to perpetuate them, by uniting together theſe ſingular individuals, as we do at preſent, when we wiſh to procure new breeds of dogs, and other animals.

Dogs which have been abandoned in the deſerts of America, and have lived wild for a hundred and fifty, or two hundred years, though changed from their original breed when they are ſprung of the domeſtic dogs, have notwithſtanding this long ſpace of time retained, at leaſt in part, their primitive form, and travellers report that they reſemble our greyhound. Theſe wild dogs, however, are extremely thin and light; and as the grey hound does not differ much from the cur, or from the dog which we call the ſhepherd's dog, it is natural to think, that theſe wild dogs are rather of this ſpecies, than real greyhounds. Ancient travellers inform us, that the dogs of Canada had the ears ſtraight like foxes, and reſembled the middle-ſized maſtiff, that is, our ſhepherd's dog, and that thoſe of the deſerts of the Aratilles iſles, had alſo the head and ears very long, and are very like foxes.

Beſides what we learn from the narratives of travellers, we find that dogs of cold climates have all long ſnouts and ſtraight ears; that thoſe of Lapland are ſmall, that their ears are ſtraight, and their ſnouts pointed; that thoſe of Siberia, known by the name of wolf-dogs, are larger than thoſe of Lapland; but that they have alſo the ears ſtraight, the hair rough, and the ſnout pointed. We learn too that thoſe of Iceland, have alſo ſome reſemblance to thoſe of Siberia; and that, even in warm climates, ſuch as the Cape of Good Hope, the dogs natural to the countries have ſharp ſnouts, ſtraight ears, the tail dragging on the ground, and the hair ſhining, but long and frizzled.

We may preſume, then, that the ſhepherd's dog approaches neareſt to the primitive races of this ſpecies; for in all countries inhabited by ſavages, or, at leaſt, by men half-civilized, the dogs reſemble this breed more than any other. On the whole continent of the new world, they had no other. In France, where this ſpecies is uſually called the ſhepherd's dog, and in other temperate climates, it is ſtill more numerous; though we are much more occupied in giving birth to, or in multiplying, the breeds which are more pleaſing, than preſerving thoſe which are more uſeful, and which we have diſdained and abandoned to the peaſants, who have the care of our flocks.

Dogs are generally produced with their eyes ſhut. The two eye lids are not only cloſed, but adhere by a membrane, which breaks away as ſoon as the muſcle of the upper eye-lid is become ſtrong enough to raiſe itſelf, and to overcome this obſtacle; and the greater number of dogs have not their eyes open till the tenth or twelfth day. At this time, the bones of the ſkull are not finiſhed, the body is puffed out, the ſnout is ſwelled, and they have not their proper form; but in leſs than a month they learn to make uſe of all their ſenſes, and begin to have ſtrength and a ſwift growth. In the fourth month, they get ſome of their teeth, which all amount to forty two.

Bitches go with young nine weeks, that is, ſixty-three days, but never leſs than ſixty. Length of life in dogs is like that of other animals, proportioned to the time required for their growth; for if they are about two years in growing, they live about fourteen years.

In the Memoirs of the Academy of Sciences, we find the hiſtory of a bitch, which having been accidentally left behind in a country-houſe, ſubſiſted forty days without any other food than the ſtuff or the wool of a mattreſs that ſhe had torn. Water ſeems to be ſtill more neceſſary for dogs than food: they drink often, and a great deal at a time; and it is even a vulgar opinion, that if they want water long, they become mad.

To give a clearer idea of the order of dogs, of their generation in different climates, and of the mixture of their breeds, I ſubjoin a table, or rather a kind of genealogical tree, in which, with a glance of the eye, all the different varieties of the ſpecies may be ſeen.

The ſhepherd's dog is the ſtock or body of the tree. This dog, tranſported into the rigorous climate of the North, as into Lapland, for example, has become ugly and ſmall. He ſeems, however, to have been kept up, and even brought to perfection, in Iceland, Ruſſia, and Siberia, where the climate is leſs rigorous, and where the people are more civilized. Theſe changes have been occaſioned by the influence of climate alone, which has produced no great alteration in the form; for all theſe dogs have ſtraight ears, long and thick hair, and a wild look.

The ſame ſhepherd's dogs, tranſported into temperate climates, and among people who are quite civilized, ſuch as thoſe of England, France, or Germany, loſe their ſavage air, their ſtraight ears, their long, thick, and rough hair, and become maſtiff, hound, or bull-dog, by the influence of climate merely. Of the maſtiff, and the bull-dog, the ears are partly ſtraight, or only half-hanging; and in their manners and ſanguinary diſpoſition they reſemble the dog, from which they drew their origin. The hound is the moſt diſtant of the three. The long hanging ears, the docility, gentleneſs, and, we may ſay, timidity of this dog, are ſo many proofs of the great degeneration, or rather the great perfection, which a long ſtate of ſubjugation has produced, joined to a careful, and well-followed education.

The hound, the ſetting-dog, and the terrier, are only one and the ſame race of dogs; for it has been remarked, that the ſame birth has produced ſetting-dogs, terriers, and hounds, though the hound bitch has only been covered by one of the three dogs.

The beagle, and almoſt all ſorts of dogs tranſported into Spain and Barbary, have hair fine, long, and thick, and become ſpaniels and barbets. The great and little ſpaniel, which differ only in ſize, when tranſported into England, change their colour from black to white, and by the influence of the climate are become large, ſmall, and ſhabby. To theſe we may add the terrier, which is but a black beagle, like the other, but with liver-coloured marks on the four feet, the eyes, and the ſnout.

The ſhepherd's dog, tranſported to the north, is become a large Dane, and into the ſouth, is become a greyhound. The large greyhounds come from the Levant; thoſe of a middle ſize from Italy. Greyhounds from the latter of theſe places, when tranſported into England become ſmaller greyhounds.

The large Danes, tranſported into Ireland, Ukrain, Tartary, Epirus, and Albany, are become large Iriſh dogs, and in ſize ſurpaſs all the reſt of the ſpecies.

The bull-dog, tranſported from England into Denmark, is become a ſmall Dane; and this ſmall Dane, when tranſported into warm climates, loſes its hair entirely, and becomes the naked Turk dog. All theſe races, with their varieties, have been produced ſolely by the influence of climate, joined to the effect of their food, and of a careful education. The other dogs are not of a pure race, and come from a mixture of theſe races.

The greyhound, and the ſhepherd's dog, have produced the mongrel greyhound, which is called the greyhound with wolf's cloathing. Of this mongrel the ſnout is not ſo thin as that of the Turkiſh greyhound, which is very rare in France.

The large Dane, and the large Spaniel, have produced together the dog of Calabria, which is a handſome dog with long, thick hair, and which is taller than the larger maſtiff.

The ſpaniel and the terrier produce another kind of dog, which is called the Burgundy ſpaniel. The ſpaniel and the little Dane produce the lion-dog, which is very ſcarce.

The dogs with long, fine, and curled hair, which are called dogs of Purgos, and which are of the ſize of the largeſt barbets, come from the large ſpaniel and the barbet.

The little barbet comes from the ſmall ſpaniel and the barbet.

The bull-dog produces, with the maſtiff, a mongrel, which is called the ſtrong bull-dog, and which is much larger than the real bull-dog, and approaches the bull-dog more than the maſtiff.

The pug comes from the Engliſh bull-dog, and the little Dane.

All theſe races are ſimple mongrels, and come from the mixture of two pure races; but there are alſo other dogs which may be called double mongrels, becauſe they come from the mixture of a pure race, and of one already mixed.

The ſhock-dog is a double mongrel, which comes from the pug and the ſmall Dane.

The dog of Alicant is alſo a double mongrel, which comes from the whelp and the little ſpaniel.

The Malteſe, or lap-dog, is a double mongrel, and comes from the ſmall ſpaniel and the barbet.

The Cat.

The cat, though an animal of prey, is a uſeful domeſtic. It is neither wanting in ſagacity nor ſentiment; but its attachments are ſtronger to places than to perſons. The form of its body correſponds with its diſpoſition. The cat is handſome, light, adroit, cleanly, and voluptuous. It loves eaſe, and ſearches out the ſofteſt furniture to lie upon.

Cats go with young fifty-five or fifty-ſix days. They are not ſo prolific as dogs, and their uſual number is four, five, or ſix. Young cats are gay, lively, pretty, and would be very proper to amuſe children, if the ſtrokes of their paws were not to be feared. Their diſpoſition, which is averſe to all reſtraint, renders them incapable of a regular education. We are told, nevertheleſs, of the Greek friars of Cyprus, having taught cats to hunt, take, catch, and deſtroy the ſerpents with which that iſland was infeſted. Their ſcent, which in the dog is an eminent quality, is far from being good, and therefore they do not purſue animals which they no longer ſee; but wait and attack them by ſurpriſe.

The moſt immediate phyſical cauſe of this inclination, which they have to ſpy out, and ſurpriſe other animals, is owing to the particular conformation of their eyes. The pupil, in man, as well as in the greater part of the lower animals, is capable of a certain degree of contraction and dilatation. It enlarges a little when there is no light, and contracts when the light becomes too ſtrong.

In the eye of a cat, and of nocturnal birds, this contraction and dilatation are ſo conſiderable, that the pupil, which in obſcurity is large and round, becomes in broad day, long and narrow like a line. For this reaſon theſe animals ſee better during the night than during the day, the form of the pupil being always round when it is not conſtrained. During the day, there is a continual contraction in the eyes of the cat, and it is only by effort, that he ſees in a ſtrong light; whereas at twilight, the pupil reſuming its natural form, he ſees perfectly, and avails himſelf of this advantage in knowing, attacking and ſurpriſing other animals.

Cats ſeem to have a natural dread of water, cold, and bad ſmells. They are fond of perfumes, and gladly ſuffer themſelves to be taken and careſſed by perſons who uſe them. The ſcent of Valerian has ſo powerful an effect on them, that they appear tranſported by it; and, in order to preſerve this plant in gardens, it is common to ſurround it with a cloſe fence. Cats will ſmell it from afar, will run and rub themſelves with it, and will paſs and repaſs ſo often over it, as to deſtroy it in a ſhort time.

As they are very cleanly, and as their coat is always dry and ſhining, their hair eaſily electrifies; and ſparks are ſeen to come from it, when rubbed with the hand in any dark place. Their eyes ſhine in the dark, almoſt like diamonds, and reflect outwardly, during the night, the light which they may be ſaid to have imbibed during the day.

In this climate, we know but one ſpecies of the wild cat; and it appears from the teſtimony of travellers, that this ſpecies is found in almoſt all climates, without any great variety. There were ſome of them on the continent of the New World before it was diſcovered. A huntſman carried one which he had found in the woods to Chriſtopher Columbus. This cat was of the common ſize, the hair of a dark grey, with the tail very long, and very ſtrong. There were ſome of the ſame ſort of wild cats in Peru, though they had no tame ones; and there are ſome in Canada, in the country of the Illineſe, &c. They have been ſeen in ſeveral parts of Africa, as in Guinea, at the Gold Coaſt, at Madagaſcar, where the original inhabitants had even domeſtic cats. At the Cape of Good Hope, Kolbe ſays, there are alſo ſome wild cats of a blue colour; and theſe blue, or rather ſlate-coloured cats, are found again in Aſia.

In general it may be remarked, that, of all the climates of the inhabited earth, thoſe of Spain and Syria are the moſt favourable to the beautiful varieties of Nature. The ſheep, the goats, the dogs, the cats, the rabbits, &c. of thoſe countries have the fineſt wool, the moſt beautiful and the longeſt hair, the moſt agreeable and the moſt varied colours. The colour of the wild cat, and its hair, like thoſe of moſt other wild animals, are rather coarſe. When tamed, the latter becomes more ſoft, the former more variegated; and in the favourable climate of Choraſan and Syria, the latter becomes longer, finer, more copious, the former uniformly ſoftened; the black and red changing into a tranſparent brown, and the dark brown into an aſh-grey. By comparing a wild cat of our foreſts with one of thoſe of Choraſan or Syria, we ſhall find that the only difference between them conſiſts in this ſhaded variety of colours. As theſe animals have therefore more or leſs white upon the belly and the ſides, it is eaſy to conceive, that, in order to have cats entirely white, and with long hair, ſuch as we properly term cats of Angora, we have only to ſelect from this race thoſe which are moſt white on the belly and the ſides, and to unite them together, as is done with rabbits, with dogs, with goats, with ſtags, with deer, &c. In the province of Pe-chi-ly, in China, there are cats with long hair, and hanging ears, of which the Chineſe ladies are exceedingly fond. Theſe domeſtic cats with hanging ears, of which we do not poſſeſs a more ample deſcription, are, no doubt, more remote than thoſe with ſtraight ears, from the race of the wild cat, which, nevertheleſs, is the original and primitive race of all cats.

CHAP. IX.

OF CERTAIN INTERMEDIATE ANIMALS BETWEEN WILD AND DOMESTIC—THE STAG, OR RED DEER.—OF THE FALLOW-DEER, THE ROEBUCK, &c.

THE Stag is one of thoſe mild, innocent animals, which ſeem as if they were created ſolely to adorn and animate the ſolitude of the foreſts, and to occupy, remote from man, the peaceful retreats of Nature. His light and elegant form; his flexible, yet nervous limbs; his head rather adorned, than armed, with a living ſubſtance, which, like the branch of a tree, is every year renewed; his grandeur, his ſwiftneſs, his ſtrength, ſufficiently diſtinguiſh him from the reſt of the inhabitants of the foreſt.

The old ſtags ſhed their horns firſt, which happens about the end of February, or the beginning of March. Stags in their ſeventh year do not undergo this change till the middle or the end of March; nor do thoſe in the ſixth year, till the month of April.

After they have ſhed their horns, they ſeparate from each other; the very young ones only aſſociating together. They remain no longer in covert; they ſeek the beautiful parts of the country, the groves, and the open coppices, where they remain all ſummer, till they recover the antlers which uſed to adorn their brows. During this ſeaſon, they carry their heads low, for fear of ſtriking them againſt the branches; for they are exceedingly tender till they arrive at perfection. The horns of the oldeſt ſtags are ſcarcely half repaired by the month of May; nor do they attain their full length and hardneſs till about the end of July. The horns of the young ſtag are very late ſhed, and very late recovered; but when they are completely lengthened, and are become quite hard, they rub them againſt the trees, in order to bruſh off the ſcruf with which they are covered.

The hinds, or females, carry their young eight months and a few days. They are not all prolific; and there is one ſort in particular which is always barren. The fawn retains this appellation no longer than till it is ſix months old; then the knobs begin to appear, and it takes the name of a knobber, which it bears till theſe knobs are lengthened to ſo many points, whence they are termed prickets, or brockets. It does not quit its dam early, though it grows faſt, but follows her all the ſummer. In winter, the hinds, the knobbers, the prickets, and the young ſtags, reſort to the herd, and form troops, which are numerous in proportion as the ſeaſon is more ſevere. In ſpring they divide, the hinds retiring to bring forth their young; and at this time there is ſcarcely any but the prickets and the young ſtags which aſſociate. In general, the ſtags are inclined to remain with each other, and to roam abroad in companies; and it is only from fear or neceſſity that they are ever found ſeparated.

The growth of the horns appears to depend on the redundancy of the fluids, and has a near connection with the production of the ſeminal fluid; for when caſtrated, the horns of the ſtag ceaſe to grow.

The beauty of this, as indeed of every part, depends much upon their food; for a ſtag which lives in a plentiful country, where he feeds at his eaſe, where he is neither diſturbed by men nor dogs, where, he may lie down and ruminate in quiet, has always a beautiful head, high, open, palmated, large, and well-adorned at top, broad and curled at bottom, with a great number of long and ſtrong antlers. In a country on the other hand where he has neither ſufficient food nor repoſe, his head will be in theſe reſpects the reverſe. Hence it is not difficult to diſtinguiſh by the horns of a ſtag, whether or not he inhabits a fertile or barren country.

The branches which ſprout from the head of the ſtag, in their make and growth, reſemble thoſe of a tree. Their ſubſtance alſo is, perhaps, more of the nature of wood than of bone. It is, as it were, a vegetable grafted upon an animal, which partakes of the nature of both, and forms one of thoſe ſhades by which Nature always approximates two extremes.

The ſtag paſſes his whole life in the alternatives of plenitude and want, of corpulence and leanneſs, of health and ſickneſs, without having his conſtitution much affected by the violence of the change. Nor is he ſhorter lived than other animals, which are not ſubject to ſuch viciſſitudes. As he is five or ſix years in growing, ſo he generally lives, thirty-five or forty years. What has been reported, therefore, concerning the prodigious longevity of the ſtag, is without any good foundation, though ſupported by the ſtory of one which was taken by Charles VI. in the foreſt of Senlis, with a collar round its neck, whereon was inſcribed, " Cæſar hoc me donavit." People choſe rather to believe that this animal had lived a thouſand years, and had received this collar from a Roman Emperor, than to conclude that he might come from Germany, where the Emperors have always aſſumed the title of Cæſar.

The horns of the ſtag continue to increaſe in bulk and height from the ſecond year to the eighth. They remain beautiful, and much the ſame, during their vigour of life; but as their body declines with age, ſo do their horns.

It is but ſeldom that our ſtags have more than twenty or twenty-two antlers, even when their head is in its moſt beautiful ſtate. And, as the ſize of the ſtag's head depends on the quantity of his food, ſo the quality of his horns depends on the quality of it. In fertile countries the quality of the horn is, like the wood of the foreſt, large, ſoft, and light; and, on the contrary, ſhort, hard and heavy, in ſuch as are barren.

The moſt common colour of the ſtag is yellow, though there are many found of a brown, and many of a red colour. White ſtags are much more uncommon, and ſeem to become domeſtic. The colour of the horns, like that of the hair, depends on the nature and age of the animal, and in general on the impreſſion of the air. The horns of the young ſtags are whiter than thoſe of the old ones. Of thoſe ſtags alſo whoſe hair is of a light yellow, the horns are often of a ſallow hue, and offenſive to the eye.

This animal ſeems to have good eyes, an exquiſite ſmell, and an excellent ear. When he would hearken to any thing, he raiſes his head, pricks up his ears, and then he hears from a great diſtance. When he iſſues from a little coppice, or ſome other ſpot half covered, he ſtops in order to take a full view around him, and then ſnuffs up the wind in order to try whether he can diſcover the ſcent of any thing that may diſturb him. Though naturally ſimple, he is far from being deſtitute of curioſity and cunning. If one whiſtles, or calls aloud to him from a great diſtance, he inſtantly ſtops ſhort, and gazes with fixed attention; but if one has neither arms nor dogs, he paſſes along without altering his pace. With equal tranquillity and pleaſure he ſeems alſo to liſten to the ſhepherd's pipe, or flageolet; and the huntſmen, in order to embolden them, ſometimes uſe theſe inſtruments. In general, he is much leſs afraid of men than of dogs, and entertains neither diſtruſt nor artifice, but in proportion as he is diſturbed. He eats ſlowly, chuſes his food, and ſeeks afterwards to repoſe himſelf, that he may ruminate at leiſure, though not with the ſame eaſe as the ox; nor is it without undergoing much violence, that the ſtag, can throw up the food contained in his firſt ſtomach. He ſeldom drinks in the winter, and ſeldomer ſtill in the ſpring.

The Fallow-deer.

No two animals can be more nearly allied than the ſtag and the fallow-deer; and yet no two animals more eagerly ſhun each other. They are never ſeen to herd in the ſame place. It is even rare, unleſs they have been tranſported thither, to find fallow deer in a country where ſtags are numerous. They ſeem to be leſs robuſt and leſs ſavage than the ſtag. They are found but rarely wild in the foreſts, and are bred up in parks, where they may be conſidered half domeſtic.

Of all the countries of Europe, England abounds moſt in ſtags; and in this country their fleſh is highly valued. It ſeems to be an animal formed for a temperate climate; for it is never found in Ruſſia, and very rarely in the foreſts of Sweden, or in any other northern country. And as the fallow-deer is an animal leſs ſavage, more delicate, and it may be added, more domeſtic than the ſtag, it is likewiſe ſubject to a greater number of varieties. Beſide the common deer, and the white deer, there are ſeveral other kinds. The deer of Spain, for example, which are almoſt as large as the ſtags, but whoſe neck is more ſlender, whoſe colour is more obſcure, and whoſe tail is rather black than white underneath, and longer than that of the common deer. The deer of Virginia, which are almoſt as large as thoſe of Spain. Other deer, whoſe forehead is compreſſed and flattened between the eyes, whoſe ears and tail are longer than thoſe of the common deer, and whoſe hind legs have the hoofs marked with a white ſpot; and others, which are ſpotted or ſtreaked with white, black, and yellow; and others ſtill, which are entirely black.

The head of the buck, like that of the ſtag, is ſhed every year, and takes nearly the ſame time for repairing.

It frequently happens, that an herd of fallow-deer is ſeen to divide into parties, and to engage each other with great ardour. They both ſeem deſirous to gain ſome favourite ſpot of the park for paſture, and to drive the vanquiſhed party into the coarſer and more diſagreeable parts. Each of theſe factions has its particular chief, namely, the oldeſt and the ſtrongeſt of each herd. Theſe lead on to the engagement; and the reſt follow under their direction. Their combats are ſingular enough, from the diſpoſition and conduct by which their mutual efforts ſeem to be regulated. They attack with order, and ſupport the aſſault with courage. They come to the aſſiſtance of each other; they retire, they rally, and never yield the victory upon a ſingle defeat. The combat is renewed every day, till at length the more feeble ſide is obliged to yield, and eſcape to the moſt diſagreeable part of the park.

From the age of two, till that of fifteen or ſixteen, the fallow-deer is in a condition to produce. In ſhort as it reſembles the ſtag in all its natural habits, the greateſt difference we find between theſe two animals, is in the duration of their lives. From the teſtimony of huntſmen, it has been mentioned, that the ſtag lives to the age of thirty-five or forty; and, on the ſame authority, it is aſſerted, that the fallow-deer lives but about twenty years. We may add, that as the fallow-deer is ſmaller than the ſtag, it is probable, that in growth it is ſomewhat quicker.

The Roe-Buck.

The ſtag, as being the moſt noble among the tenants of the woods, inhabits the moſt ſecret parts of the foreſt, where the ſpreading branches form a lofty covert. Whilſt the roe-buck contents himſelf with a more lowly reſidence, and is ſeldom found but among the thick foliage of young trees and ſhrubs. But, if this animal is leſs noble, leſs ſtrong, and leſs elevated in ſtature, he is, however, poſſeſſed of more grace, more vivacity, and even of more courage, than the ſtag. Though but a ſmall animal, yet, when his young are attacked, he combats even the ſtag himſelf, and often obtains the victory. He is more gay, more handſome, more active; his ſhape is more full and more elegant, and his figure is more agreeable than that of the ſtag. His eyes, in particular, are more brilliant, and more animated; his limbs are more ſupple, his movements quicker; and, poſſeſſed of equal vigour and agility, he bounds without effort.

The roe-buck differs from the ſtag, not only in ſuperior cunning, but alſo in his natural appetites, his inclinations, and his whole habits of living. Inſtead of herding together like the latter, the ſpecies of the former live in ſeparate families. The ſire, the dam, and the young ones, form of themſelves a little community, nor do they ever admit a ſtranger into it. All other animals of the deer kind, are inconſtant in their affection. The roe-buck never forſakes his mate; and as they have been generally bred up together, the male and female form for each other the ſtrongeſt attachment.

The female of this ſpecies goes with young five months and a half, and brings forth about the end of April, or the beginning of May. The hind goes more than eight months; which circumſtance of itſelf is ſufficient to prove, that theſe animals are of a ſpecies ſo different, that they can never produce an intermediate race. The female ſeparates herſelf from the male, when ſhe is about to bring forth, retiring into the thickeſt part of the woods, in order to avoid the wolf, which is her moſt dangerous enemy. At the expiration of about ten or twelve days, the fawns, of which there are generally two at a birth, attain ſtrength enough to follow her. When ſhe is threatened with any danger, ſhe hides them in ſome deep thicket, oppoſes herſelf to the danger, and allows herſelf to be chaced.

The fawns continue to follow the buck and the doe eight or nine months in all; and upon ſeparating, their horns begin to appear, like thoſe of the ſtag, the firſt year, ſimple, and without antlers. Theſe they ſhed at the latter end of autumn, and renew during the winter.

In the ſtag, the fallow deer, and the roe-buck, there are two bony eminences, on which their horns grow, which begin to ſhoot at the end of five or ſix months, and which, ſoon after arrive at their full growth. Far, however, from enlarging themſelves as the animal advances in age, they diminiſh, and are beſt evidence of the age of the ſpecies.

As the female goes only five months and a half with young, and as the growth of the young roe-buck is quicker than that of the young ſtag, ſo his life is ſhorter; and I do not believe that it extends beyond twelve or fifteen years, at the fartheſt. The roe-bucks remain in winter in the thickeſt coppices, and live on briars, broom, heath, &c. In ſpring, they repair to the more open groves, and browſe upon the buds and young freſh leaves of almoſt every tree. This warm food, fermenting in their ſtomachs, inebriates them much, and renders them eaſy to be ſurpriſed.

It appears, that this ſpecies, which is not ſo numerous as that of the ſtag, and which is very ſeldom to be found in many parts of Europe, is pretty numerous in America. In that country, however, we hear only of two ſorts, the red, which is the larger, and the brown, which is the ſmaller; and, as they are oftener found in the northern than in the ſouthern parts of that continent, we may preſume, that they differ more from each other there than they do in Europe. In Louiſiana, for inſtance, they are extremely common, and are much larger than in France. They are alſo found at Braſil; for the animal which is there denominated the *Cujuacu-apara*, differs not from the European roe-buck, more than the Canadian ſtag differs from that of France.

CHAP.

C H A P. X.

OF WILD ANIMALS—THE HARE, AND THE RABBIT.

The Hare.

HARES abound in every quarter of the globe; and rabbits, though they originated only in particular climates, multiply ſo prodigiouſly in almoſt every place to which they are tranſported, that no ſmall art is required to diminiſh their number.

In thoſe diſtricts which are reſerved for the chace, four or five hundred hares are killed in the courſe of perhaps one day's ſport. Theſe animals multiply amazingly; they are in a condition to engender in all ſeaſons, and that too before their firſt year is expired. The females do not go above thirty or thirty-one days with their young. They produce three or four young ones, and they are again ready to receive the male. They likewiſe receive him while they are pregnant, and, by a particular formation of their genitals, are often found to have a ſuper-fœtation.

The young ones are brought forth with their eyes open. The dam ſuckles them for the ſpace of twenty days; after which they leave her, and provide for themſelves; they do not part far from each other; yet they live in ſolitude, and each compoſes for itſelf a form, at a little diſtance. Thus, when we find a young leveret in one place, we are almoſt ſure of finding one or two more in the neighbourhood. They feed more by night than by day; and their favourite articles of food are, herbs, roots, leaves, fruit and grain; but particularly ſuch plants as yield a milky juice. They even eat the bark of trees in winter. When they are reared at home, they are fed with lettice and roots; but the fleſh of theſe domeſtic hares has always a bad flavour.

Hares ſleep much, but always with their eyes open. They have no eye-laſhes, and ſeem to have but bad eyes. Their hearing, however, is exceedingly acute, and their ears are very large compared with the ſize of their body. They move theſe long ears with great eaſe, and uſe them as a helm, in order to direct their courſe, which is ſo rapid, that they outſtrip almoſt every other animal. As their fore legs are much ſhorter than their hind ones, they can more eaſily aſcend than deſcend; for which reaſon, when they are purſued, their firſt object is to gain, if poſſible, ſome mountain. Their motion in running is a kind of gallop. They proceed without making any noiſe, becauſe their feet are plentifully covered with hair; and they perhaps are the only animals which have hair growing within their mouths.

The hare does not live above ſeven or eight years. They paſs their lives in ſolitude, and in ſilence; and they are never known to exert their voice, but when they are forcibly laid hold of, tormented, or wounded. They are by no means ſo wild as by their habits might be ſuppoſed. They are gentle, and ſuſceptible of a ſpecies of improvement. As they have a good ear, as they reſt on their hind-feet of their own accord, and uſe their fore-legs like arms, ſome have been taught to beat a drum, and to geſticulate in cadence, &c.

In general, the hare is not deſtitute of the inſtinct neceſſary for its preſervation, nor of ſagacity ſufficient to effect an eſcape from its enemies. It prepares for itſelf a form; and in winter, it chuſes a ſpot which is expoſed to the ſouth, as in ſummer it does one which is ſituated to the north. It hides itſelf from view among hillocks of earth which are of the ſame colour as its hair. "I have ſeen," ſays Du Foilloux, "a hare ſo cunning, that, as ſoon as it heard the huntſman's horn, it ſtarted from its form, and, though at the diſtance of a quarter of a league from it, leaped to a pond where it hid itſelf among the ruſhes, and thus eſcaped the purſuit of the dogs. I have ſeen a hare, which, after having run above two hours before the dogs, has diſlodged another hare, and taken poſſeſſion of its form. I have ſeen others ſwim over three ponds, of which the ſmalleſt was not leſs than eighty paces broad. I have ſeen others, which, after having been warmly chaced for two hours, have entered a ſheep-cot, through the little opening under the door, and remained among the cattle. I have ſeen others, when purſued, join a flock of ſheep in the field, and remain with them. I have ſeen others, which, when they heard the dogs, have concealed themſelves in the earth. I have ſeen others, which have gone along one ſide of a hedge, and returned by the other; ſo that there was only the thickneſs of the hedge between the dogs and them. I have ſeen others, which, after they had been chaſed for half an hour, have mounted an old wall of ſix feet high, and taken refuge in a hole covered with ivy."

The nature of the ſoil has a great influence on theſe, as well as on every other animal. The hares of the mountains are larger and fatter than thoſe of the plains, and they are alſo of a different colour; the former being browner on the body, and whiter about the neck, than the latter, which are more inclined to red. On high mountains, and in the northern countries, they become white in the winter, and in ſummer regain their ordinary colour.

The Rabbit.

Though the hare and the rabbit are externally, as well as internally, very much alike, yet they form two diſtinct and ſeparate ſpecies.

The fecundity of the rabbit is even greater than that of the hare. Without crediting, however, what Wotten has advanced, that one pair being left in an iſland, produced ſix thouſand in one year, it is certain, that theſe creatures multiply ſo prodigiouſly in countries which are proper for the breed, that the earth cannot furniſh them with ſubſiſtence. They deſtroy herbs, roots, grain, fruit, and even trees and ſhrubs; and, were it not for the dog and the ferret, they would reduce the country to a deſert. The rabbit not only engenders and produces oftener than the hare, but it has more ways to eſcape from its enemies, and to conceal itſelf from man.

This circumſtance alone may ſuffice to prove, that the rabbit is ſuperior to the hare in point of ſagacity. Both are alike in their conformation, and both have it in their power to dig retreats for themſelves. Both are timid to an exceſs; but the one, poſſeſſed of leſs art, is contented with forming for itſelf a reſidence on the ſurface of the earth, where it remains continually expoſed. While the other, by a more improved inſtinct, takes the trouble to dig into the earth, for an aſylum; and ſo true is it, but as in this caſe they act from ſentiment, we never ſee the domeſtic rabbit employed in the ſame work.

The domeſtic rabbits, like all other domeſtic animals, vary in their colour: white, black and grey belong properly to Nature. The black rabbits are the moſt ſcarce.

Theſe animals are able to engender and produce at the age of five or ſix months. It is aſſerted, that they commonly attach themſelves to one particular female, and never quit her. She goes with young thirty or thirty-one days, and will produce five, ſix, and ſometimes ſeven or eight at a birth. Like the doe-hare, ſhe has a double matrix, and of conſequence can have in her womb at the ſame time, two ſeparate litters. It appears, however, that ſuper-fœtations are leſs frequent in this ſpecies than in that of the hare.

A few days before they bring forth, they dig themſelves a freſh burrow, not in a right line, but in a crooked direction, at the bottom of which they make an excavation. After this they tear a quantity of hair from their bellies, and make a kind of bed for the uſe of their young. For the firſt two days they never quit them: they never ſtir abroad, unleſs forced by neceſſity, and they return immediately. At this ſeaſon they eat much and very quickly; and thus they tend and ſuckle their young above ſix weeks. Till after this period, the buck does not make his advances to the doe. Often, even when ſhe quits the burrow and leaves her young behind, ſhe ſtops up the entry to it with earth, diluted with her urine; but when they begin to venture to the edge of the hole, and to eat groundſel and other herbs which the doe picks out for them, the buck begins to take them between his paws, to endeavour to give a gloſs to their hair, to lick their eyes; and all of them, in their turn, partake equally of his care.

A gentleman, in my neighbourhood, who had amuſed himſelf with raiſing rabbits for many years, has favoured me with the following remarks.

"I began," ſaid he, "with only one male and one female, the former white, the latter grey; and of their produce, which was very numerous, the greateſt part were grey, a good number of them white, and of mixed colour, and ſome few black. Theſe animals ſeem to have a great reſpect for paternal authority; at leaſt I judge ſo, from the great deference which all my rabbits ſhewed for their firſt anceſtor, whom I can always eaſily diſtinguiſh by his whiteneſs, and who is indeed the only male of that colour which I have preſerved. It was to no purpoſe the family increaſed. Thoſe which, in their turn, became fathers, were ſtill ſubordinate to him. Whenever they fought, whether on account of their females, or concerning their food, their great progenitor would run to the place of diſpute with all ſpeed, as ſoon as he heard the noiſe. No ſooner did they perceive him, than every thing was preſently reduced to order; and if he ſurpriſed any one of them actually aſſaulting another, he uſed to ſeparate him from the reſt, and puniſh him upon the ſpot. Another proof of his dominion over all his poſterity, is, that they were accuſtomed to return at a whiſtle. Whenever I gave the ſignal, how diſtant ſoever they might be, this old one immediately put himſelf at their head; and though he came firſt, yet he made them all file off, and enter before him.

CHAP. XI.

OF CARNIVOROUS ANIMALS—THE WOLF—THE FOX—THE BADGER—THE OTTER—THE MARTIN—THE PINE WEASEL—THE POLE CAT—THE FERRET—THE WEASEL—THE ERMINE.

ANIMALS which have but one ſtomach, and whoſe inteſtines are ſhort, are forced, like man, to feed on fleſh. Of this affinity, and of this truth, we ſhall procure certain information by a relative compariſon of the ſize of the inteſtinal canal in carnivorous animals, and in thoſe that live ſolely on herbage. We ſhall then find, that the difference in the manner of living depends ſolely on the difference in their conformation, and that their nouriſhment is more or leſs ſolid, as the receptacle for it is more or leſs capacious.

Hence, however, we muſt not conclude, that thoſe animals which live ſolely on herbage are, from phyſical neceſſity, as carnivorous animals are with reſpect to fleſh, abſolutely confined to one kind of food. It is not meant, that they might not uſe animal food, or that if Nature had furniſhed them with arms, not only for the purpoſes of ſelf-defence, but for thoſe of attack and rapine, they would not have exerted them; ſince we find, that ſheep, calves, goats, horſes, greedily eat milk and eggs, which are animal food, and that, unaided by cuſtom, they do not refuſe meat which has been haſhed and ſeaſoned with ſalt.

We need not, therefore, ſcruple to conclude, that the generally predominant appetite of animals is for fleſh and other ſolid food, and that this appetite is more or leſs vehement, more or leſs moderate, according to the particular conformation of each animal. For on taking a full view of Nature, we find it not only in man, but in quadruped animals, in fiſhes, and even in inſects, and in worms.

The Wolf.

The wolf is one of thoſe animals whoſe appetite for animal food is the moſt vehement, and whoſe means of ſatisfying this appetite are the moſt various. Nature has furniſhed him with ſtrength, with cunning, with agility, with all thoſe requiſities, in a word, which fit an animal for purſuing, overtaking, and conquering its prey. Notwithſtanding all theſe, he moſt frequently dies of hunger; for he is the declared enemy of man. Being long preſcribed, and a reward offered for his head, he is obliged to fly from the habitations of men, and to live in the foreſt. When preſſed with hunger, however, he braves danger, and comes to attack thoſe animals which are under the protection of man, particularly ſuch as lambs, ſheep, or even dogs themſelves. If this excurſion has ſucceeded, he often returns to the charge, till having been wounded, or cloſely purſued by the dogs or the ſhepherds, he hides himſelf by day in the thickeſt coverts, and, for a while, only ventures out at night. At laſt, however when his neceſſities are very urgent, he boldly faces certain deſtruction. He attacks women and children, and ſometimes ventures even to fall upon men. He becomes furious by his continual agitations, and ends his life in madneſs.

The wolf, as well externally as internally, ſo nearly reſembles the dog, that he ſeems modelled upon the ſame plan; and yet he only preſents us with the reverſe of the image. If his form be ſimilar, his nature is, however, different; and indeed they are ſo diſſimilar in their diſpoſitions, that no two animals can have a more perfect antipathy to each other. A young dog ſhudders at the ſight of a wolf; a dog who is ſtronger, and who knows his ſtrength, briſtles up at the ſight, teſtifies his animoſity, attacks him with courage, endeavours to put him to flight, and exerts his utmoſt efforts to rid himſelf of ſo hateful a creature. They never meet without flying from, or fighting with each other. If the wolf is the ſtronger, he tears and devours his prey. The dog, on the contrary, is more generous, and contents himſelf with his victory.

The dog, even in his ſavage ſtate, is not cruel; he is eaſily tamed, and continues firmly attached to his maſter. The wolf, when taken young, becomes tame, but never affectionate. Nature is ſtronger in him than education; he reſumes, with age, his natural diſpoſitions, and embraces the firſt opportunity to return to his native woods. Dogs, even of the dulleſt kinds, ſeek the company of other animals, and they are naturally diſpoſed to follow and accompany them. The wolf, on the contrary, is the enemy of all ſociety, nor does he keep much company even with thoſe of his kind. When they are ſeen in packs together, it is not to be conſidered as a peaceful ſociety, but a combination for war. They teſtify their hoſtile intentions by their loud howlings, and by their fierceneſs diſcover a project for attacking ſome great animal, ſuch as a ſtag or a bull, or for deſtroying ſome formidable dog. The inſtant their military expedition is compleated, their ſociety is at an end. They then part, and each returns in ſilence to his ſolitary retreat. There is not even any ſtrong attachment between the male and female; they ſeek each other only once a year, and remain but a few days together.

The difference in the duration of the pregnancy of the ſhe-wolf, who goes with young above an hundred days, and the bitch, who does not go above ſixty, proves, that the wolf and the dog, ſo different in diſpoſition, are ſtill more ſo in one of the principal functions of the animal œconomy.

The wolf generally brings forth five or ſix, and ſometimes even nine at a litter. The cubs are brought forth, like thoſe of the bitch, with the eyes cloſed. The dam ſuckles them for ſome weeks, and teaches them occaſionally to eat fleſh, which ſhe prepares for them, by chewing it firſt herſelf. They do not leave the den where they have been littered, till they are ſix weeks or two months old. It is not, however, till they are about ten or twelve months old, and till they have ſhed their firſt teeth and compleated the new, that the dam thinks them in a capacity to ſhift for themſelves. Whenever they have acquired arms from Nature, and have learned induſtry and courage from her example, ſhe declines all future care of them, and is again engaged in rearing a new progeny. Theſe animals require two or three years for their growth, and live to the age of fifteen or twenty.

The wolf grows grey as he grows old, and his teeth wear, like thoſe of moſt other animals. He ſleeps when his belly is full, or when he is fatigued, rather by day than night, and is always very eaſily waked. He drinks frequently; and in times of drought, when there is no water to be found in the trunks of old trees, or in the pools about the foreſt, he often viſits the brooks, or lakes in the plain. Although very voracious, he ſupports hunger for a long time, and often lives four or five days without food, provided he is ſupplied with water.

The wolf has great ſtrength, particularly in his foreparts, in the muſcles of his neck and jaws. He carries off a ſheep in his mouth without letting it touch the ground, and runs with it much ſwifter than the ſhepherds who purſue him. Hence nothing but the dogs can overtake, or oblige him to quit his prey. He bites cruelly, and always with greater vehemence in proportion as he is leſs reſiſted; for he uſes precautions with ſuch animals as attempt to ſtand upon the defenſive. He is cowardly, and never fights but when under a neceſſity of ſatisfying his hunger, or of making good his retreat. When he is wounded by a bullet, he is heard to howl; and yet, when ſurrounded by the peaſants, and attacked with clubs, he never howls, but defends himſelf in ſilence till the laſt.

If he happens to be caught in a pit-fall, he is for ſome time ſo aſtoniſhed, that he may be killed without offering to reſiſt, or taken alive without much danger. At that inſtant, one may clap a collar round his neck, muzzle him, and drag him along, without his ever betraying the leaſt ſymptom of anger or reſentment. At all other times, he has ſenſes in great perfection. He ſmells a carcaſe at the diſtance of more than a league. He alſo perceives living animals a great way off, and follows them a long time upon the ſcent. Whenever he leaves the wood, he always takes care to go out againſt the wind. No ſooner does he arrive at its extremity, than he ſtops to examine, by his ſmell, on all ſides, the emanations that may come either from his enemy or his prey, which he very nicely diſtinguiſhes. He prefers thoſe animals which he kills himſelf to thoſe he finds dead; and yet, he does not diſdain theſe, though ever ſo much infected, when no better is to be had. He is particularly fond of human fleſh; and, perhaps, if he had it in his power, he would eat no other. Wolves have been ſeen following armies, and arriving in numbers upon the field of battle, where they devoured ſuch dead bodies as were left upon the field, or but careleſsly buried. Theſe, when once accuſtomed to human fleſh, ſeek particularly to attack mankind, prefer the ſhepherd to his flock, and devour women, and carry off children. Theſe dreadful wolves are called *ware-wolves*, that is, wolves of which we ought to be *aware*.

The colour of this animal differs according to the different climates in which it is bred, and often changes even in the ſame country. Beſide the common wolves which are found in France and Germany, there are others with thicker hair, inclining to yellow. In the northern climates, ſome are found quite black, and ſome entirely white. The former are larger and ſtronger than thoſe of any other kind.

The Fox.

This animal has always been famous for his artifices; and the reputation he has thus acquired, he partly merits. What the wolf cannot acompliſh but by his ſuperior ſtrength, the fox accompliſhes by his ſuperior cunning. Without attempting to oppoſe either the ſhepherd, his dog, or his flock, he finds an eaſier way to ſubſiſt. Patient and prudent, he waits the opportunity for depredation, and varies his conduct as he perceives that circumſtances vary. Though as indefatigable and more nimble than the wolf, he does not truſt entirely to the ſwiftneſs of his courſe, but contrives for himſelf an aſylum, to which he retires in caſes of neceſſity, and in which, ſheltered from danger, he brings up his young.

The fox generally fixes his reſidence at the edge of a wood, and yet not far removed from ſome cottage, or ſome hamlet. He liſtens to the crowing of the cock, and the cackling of other domeſtic fowls. Even at a conſiderable diſtance he ſcents them, and ſeizes his opportunity. If he be able to get into the yard, he begins by levelling all the poultry without remorſe. After this, he carries off a part of the ſpoil, hides it at ſome convenient diſtance, and again returns to the charge. Taking off another fowl in the ſame manner, he hides that alſo, though not in the ſame place; and in this manner perſeveres, till, warned by the approach of day, or the noiſe of the family, he finally retires. He practiſes the ſame arts when he finds birds entangled in ſprings laid for them by the fowler, whom the fox anticipating very expertly ſnatches the birds out of the ſnare, conceals them in different places, leaves them there ſometimes for two or three days, and is never at a loſs to recover his hidden treaſure. He is equally alert in ſeizing the young hares and rabbits, before they have ſtrength to eſcape him; and when the old ones are wounded and fatigued, he is ſure to ſeize them in the moments of diſtreſs. In the ſame manner he finds out the neſts of the partridge and the quail, and ſeizes the dam while ſitting.

The fox is ſo voracious, that, when he has no better food, he devours rats, mice, lizards, toads and ſerpents. Inſects and ſhell-fiſh ſometimes ſerve him for food. In vain does the hedge-hog roll itſelf up into a ball to oppoſe him. The waſp and the wild bee are attacked by him with equal ſucceſs. Though at firſt they fly out upon their invader, and actually oblige him to retire, yet this repulſe is but for a few minutes, till he has rolled himſelf upon the ground, and thus cruſhed ſuch as may have ſtuck to his ſkin. He then returns to the charge, and at length, by dint of perſeverance, obliges them to abandon their combs, which he greedily devours.

The young foxes are produced blind, like dogs. Like them, too, they are eighteen months or two years in reaching their full growth, and live about thirteen or fourteen years. The ſenſes of the fox are as good as thoſe of the wolf; his ſentiment is more acute, and the organ of his voice is more ſupple, and more perfect. The wolf is never heard but by dreadful howls, while the fox only yelps, barks, and ſends forth a moanful ſound, reſembling the cry of the pea-cock. His tones, too, are different, according to the different ſentiments with which he is affected. He has one ſound expreſſive of deſire, a ſecond of murmur, a third of ſorrow, and a fourth of pain. The latter is never heard from him, unleſs in the inſtant that he is wounded by a ſhot, and has loſt the uſe of ſome member; for, like the wolf, when attacked with cudgels alone, he never murmurs, but will defend himſelf with obſtinacy, and fight in ſilence to the laſt. He bites dangerouſly, and with ſuch determined fury, that, in order to make him relinquiſh his hold, ponderous wood, and even iron bars, are neceſſary.

The fleſh of the fox is not ſo bad as the fleſh of the wolf. Dogs, and even men, eat it in autumn, eſpecially if the animal has fed on grapes; and, in winter, good furs are made of his ſkin. He ſleeps ſo ſound, that, however cloſely approached, there is no great danger of awaking him. When he only means to reſt himſelf, he ſtretches out his hind legs, and remains flat upon his belly. In this poſture he watches for the birds as they perch on the hedges; who no ſooner perceive him than they give each other warning of their danger. The jackdaw and the magpie, in particular, often follow him to the diſtance of ſome hundred paces, ſtill towering beyond his reach, and with their cries, and notes of hoſtility, appriſe other animals to beware.

Of all wild animals, the fox is moſt ſubjected to the influence of climate; and there are found nearly as many varieties in this ſpecies, as in that of any domeſtic animal. The generality of the French foxes are red; of ſome, however, the hair is of a greyiſh caſt; and, of all, the tip of the tail is white. In the northern countries we find foxes of all colours.

The Badger.

The Badger is a lazy, diſtruſtful, ſolitary animal, that retires far from the approach of man, and digs a ſubterranean reſidence, where it ſpends, at leaſt, three fourths of its exiſtence, and never ventures forth but in ſearch of food. It burrows in the ground with particular eaſe, as its body is rather of an oblong form, and its claws, thoſe eſpecially of the fore feet, are long and compact. The hole which it thus forms to itſelf, is often at a very great diſtance from the ſurface of the earth, and the paſſage to it is always oblique and winding.

The fox, who is leſs expert at ſuch excavations, often appropriates to his own convenience the labours of the badger. Unable to compel him from his retreat by force, he often expels him by ſtratagem, often remains a fixed centinel at the mouth of the paſſage, and, as an infallible expedient, it is ſaid, emits his ordure. When the badger has left it, he immediately takes poſſeſſion of it, enlarges it, and accommodates it to his own purpoſe. Though forced to remove to another habitation, this animal does not remove to another country. At a little diſtance from its old burrow, it forms a new one, from which it never ſtirs but at night. The dogs eaſily overtake it, when it is at any diſtance from its hole; and then, exerting all its ſtrength, all its powers of reſiſtance, it throws itſelf upon its back, and defends itſelf with deſperate reſolution.

Several badgers have been brought to me, and ſome of them I kept a long time. The young ones are eaſily tamed; they will play with young dogs, and, like them, will follow any perſon whom they know, and from whom they receive their food; but the old ones, in ſpite of every effort, ſtill remain wild. They are neither miſchievous nor voracious, as the fox and the wolf are, yet they are carnivorous; and though raw meat is their favourite food, yet they will eat any thing that comes in their way. They ſleep the greateſt part of their time, without, however, being ſubject, like the mountain-rat, or the dormouſe, to a torpor during the winter. Hence though they feed moderately, they are always fat.

They keep their hole exceedingly clean, nor are they ever known to void their ordure in it. The male is rarely to be found with the female.

In ſummer ſhe brings forth, and her uſual number is three or four at a birth. Theſe ſhe feeds at firſt with her milk, and afterwards with ſuch petty prey as ſhe can ſurpriſe. She ſeizes young rabbits in the warren, robs birds of their young, finds out where the wild bees have laid up their honey, where field-mice, lizards, ſerpents, and graſshoppers,

hoppers, are to be met with; and carries all to her expecting brood, which ſhe frequently brings forward to the mouth of her hole.

Theſe animals are naturally of a chilly temperament. Such as are reared in a houſe ſeem never more happy than when near a fire. They are likewiſe very ſubject to the mange; and, unleſs carefully waſhed, the dogs that penetrate into their burrows are infected with the ſame diſtemper.

The hair of the badger is always filthy; between the anus and the tail there is an opening, which, though it has no communication with any interior part, and is hardly an inch deep, continually emits an oily liquid. This the animal is fond of ſucking. Its fleſh is not abſolutely nauſeous; and of its ſkin are made coarſe furs, collars for dogs, trappings for horſes, &c.

The Otter.

The Otter is a voracious animal which, more fond of fiſh than of fleſh, is ſeldom found but at the ſides of lakes and rivers. It ſwims with more facility than even the beaver. All the feet of the otter have membranes; and it can hardly walk faſter than it ſwims.

Accurately conſidered, the otter cannot be pronounced an amphibious animal. We even find them drowned when they happen to have been entangled in a net; and this evidently for want of having had time to deſtroy it, and thereby effect their eſcape. For want of fiſh, frogs, water-rats, or other nouriſhment, it will eat the young branches, and the bark, of aquatic trees; and in ſpring it will eat new graſs. Of cold it is as little afraid as of moiſture. It brings forth in the month of March. Three or four is the number generally produced at a birth.

The otter becomes induſtrious with age, and wages a ſucceſsful war againſt the tribes of fiſhes, which, with reſpect to inſtinct and ſentiment, are greatly inferior to other animals. It does not dig its own habitation, but fixes its reſidence in the firſt hole that offers, under the root of the willow or poplar-tree, in the clefts of rocks, and even among piles of floating wood; and there the female brings forth her young. It, however, frequently changes its reſidence; and diſperſes its young ones at the end of ſix weeks, or two months.

The Martin.

The generality of naturaliſts have conſidered the martin and the pine-weaſel as animals of the ſame ſpecies. They are, however, different both in diſpoſition and temperament. The pine-weaſel ſhuns open countries, confines itſelf to the boſom of the foreſt, fixes its reſidence upon ſome tree, and is never found in great numbers but in cold climates. The martin on the other hand, not only approaches human habitations, but even forms a reſidence for itſelf in old buildings, in hay-lofts, in holes of walls, and while the ſpecies is generally diffuſed in great numbers over all the temperate climates, it is not to be met with in the regions of the North.

The countenance of the martin is very ſharp; its eye is lively, its limbs are ſupple, its body is flexible, and all its movements are quick. It rather leaps and bounds than walks; and with great facility climbs walls, enters pigeon-houſes, and hen-houſes, devours the eggs, the pigeons, and the hens, as on other occaſions it does mice, rats, moles, and birds in their neſts.

This animal is ſaid to bring forth as often as the cat. The growth of the young ones is very quick; and hence it may be inferred, that it is an animal whoſe life does not exceed eight or ten years. Its ſmell, which is not abſolutely diſagreeable, is like that of counterfeit muſk. Both the martin and the pine-weaſel, as well as a number of other animals, have interior veſicles which contain a ſtrong-ſcented ſubſtance like that of civet.

The Pine-Weaſel.

The pine-weaſel, is originally a native of the north, and is in a manner peculiar to that climate, where they are ſo numerous, that the quantity of furs produced from them, and carried into foreign countries, is aſtoniſhing. In temperate climates, on the contrary, it is rarely, and in warm climates never, to be found. There are ſome in Burgandy, and ſome in the foreſt of Fontainbleau; but in general they are as ſcarce in France as the martin is common. There are none in England, becauſe in that country there are no very extenſive woods.

Alike averſe to open countries, and to countries which are inhabited, it remains in the boſom of ſome foreſt, ranges through the labyrinths of the thicket, or towers aloft upon the branches of the trees. It ſubſiſts by the chace, and deſtroys a prodigious quantity of birds. Of the ſquirrel, the dor-mouſe, &c. it alſo makes a prey; and it is known to eat honey as well as the martin.

Its neck is yellow, whereas that of the martin is white; and its hair, at the ſame time, is much finer, thicker, and leſs ſubject to ſhed.

When the female is near her time, her cuſtom is to climb to the neſt of ſome ſquirrel, to drive her from it, to enlarge it for her own purpoſe, and to bring forth her young in it. In the ſame manner, ſhe occupies the old neſts of the owl and the buzzard, as alſo the hollow places of trees, from which ſhe preſently diſlodges the wood-pecker, and other birds.

The Pole-Cat.

The pole-cat is ſomewhat ſmaller than the martin. Its tail is ſhorter, its ſnout ſharper, and its hair thicker and blacker. It has ſome white on its forehead, and about the noſe and mouth. It differs likewiſe in its voice; the cry of the martin being rather ſharp and loud, that of the pole-cat deeper and more hollow. The pole-cat, however, does not at all reſemble the martin in ſmell, which, in the former is perfectly fetid. When heated or enraged eſpecially, it emits a ſtench that is abſolutely intolerable. The dogs will not eat its fleſh; and even its ſkin, though good in itſelf, ſells at a very low price, as it can never be entirely diveſted of its natural odour.

The Ferret.

It has been doubted by ſome whether or not the ferret and the pole-cat were animals of two different ſpecies. Perhaps, the reſemblance there ſometimes is in the colour of their hair firſt gave riſe to this doubt. The pole-cat, nevertheleſs, a native of temperate climates, is an animal wild like the martin; whereas the ferret, originally an inhabitant of hot countries, cannot exiſt in France, unleſs as a domeſtic animal. The ferret alſo, and not the pole-cat, is made choice of to drive the rabbits from their burrows, chiefly becauſe it is more eaſily tamed. The ferret has a longer and thinner body, a narrower head, and a ſharper ſnout, that the pole-cat. It has not the ſame ſagacity in providing for its ſubſiſtence; it cannot exiſt, at leaſt in our regions, without the care of man, nor have ſuch of the ſpecies as have been loſt in the burrows of rabbits, been ever known to multiply in the country; but have, on the contrary, periſhed, to all appearance, by the ſeverity of the winter.

This animal is an enemy to the rabbit. If even a dead one is preſented to a young ferret which had never ſeen one before, it ſprings at it, and tears it with fury; if it be a living one, it ſeizes it by the neck and noſe, and inſtantly begins to ſuck its blood. When the ferret is let looſe into the burrows of the rabbits, it is neceſſary to muzzle him, that he may not kill them, but only make them to run out, and thereby fall into the net laid for them at the entry. If he is allowed to go unmuzzled, there is a riſque of loſing him, becauſe, after having ſucked the blood of the rabbit, he will fall aſleep. Beſides the ſmoke which is raiſed at the mouth of the burrow does not always prove a ſufficient expedient for bringing him back, as there are often more iſſues than one, and one burrow generally communicates with others.

The Weaſel.

The common weaſel is as frequent in temperate and in hot countries, as it is rare in cold ones. Though of the ſame ſpecies, it is in many reſpects different from the ermine, which is a native of the north.

When a weaſel enters a hen-rooſt, it never meddles with the cocks or the old hens. It makes choice of the pullets, the young chickens, all of which he kills with a ſingle ſtroke on the head, and carries away one after another. It alſo deſtroys the eggs, and ſucks them with incredible avidity. In winter it generally reſides in ſome granary, or hay-loft; where the female often continues even in the ſpring, in order to bring forth her young among the hay or ſtraw. During this time the weaſel makes war with the rats and mice with more ſucceſs than the cat; for it follows them into all their holes, and prevents their eſcape. It alſo climbs up to the pigeon-houſes, to the neſts of ſparrows, &c. and commits great havock. In ſummer, it removes to ſome diſtance from the houſes, always chuſing the lower countries about the mills and ſtreams, hiding itſelf among the buſhes, in order to catch birds, and not unfrequently taking up its habitation in the hollow of an old willow. The female generally brings forth four or five. The young ones come forth with their eyes ſhut, but in a little time they attain a ſufficiency of growth and ſtrength to follow their dam to the chace. They attack adders, water rats, moles, field-mice, &c. and, traverſing the meadows, devour quails and their eggs.

Like the pole-cat and the ferret, theſe animals have ſo ſtrong a ſcent that they cannot be kept in any place that is inhabited. As their own ſmell is very bad, they ſeem to ſuſtain no inconvenience from any foreign ſtench or infection. A peaſant in my neighbourhood took, one day, three weaſels newly brought forth, in the carcaſe of a wolf which had been ſuſpended by its hind-legs from one of the branches of a tree; and though the wolf was almoſt entirely rotten, the old weaſel, brought graſs, ſtraw, and leaves, in order to make a bed for her young ones in the cavity of the thorax.

The Ermine, or Stoat.

The weaſel with a black tail is called the ermine when it is white, and the ſtoat when it is red or yellowiſh. Though it is a leſs common animal than the weaſel, yet there are numbers to be found in the old foreſts, and ſometimes during the winter in the neighbourhood of woody grounds. It is always eaſy to diſtinguiſh it from the common weaſel, becauſe the tip of its tail is always of a deep black, while the edge of its ears, and the extremities of its feet are white.

CHAP. XII.

OF CERTAIN SMALLER ANIMALS OF THE CARNIVOROUS CLASS—THE SQUIRREL—THE RAT—THE MOUSE—THE LONG-TAILED FIELD-MOUSE—THE WATER-RAT—THE SHORT-TAILED FIELDMOUSE—THE GUINEA-PIG—THE HEDGE-HOG—THE SHREW-MOUSE—THE WATER-SHREW-MOUSE—THE MOLE—THE BAT—THE FAT SQUIRREL—THE GARDEN-SQUIRREL, OR GREATER DORMOUSE—THE DORMOUSE—THE BROWN RAT—THE MARMOT.

THE Squirrel is a beautiful little animal, which is only half-wild, and which, by its gentleneſs, its docility, and even the innocence of its manners, might deſerve to be exempted from the preſent claſs. It is neither a carnivorous nor an injurious animal, though it ſometimes ſeizes on birds; its general food conſiſting of fruit, almonds, hazle-nuts, beech-maſt, and acorns. It is neat, cleanly, alert, lively, and induſtrious. Its eyes are full of fire, its countenance is ſharp, its body is nervous, and its limbs are ſupple.

The beauty of its form is farther embelliſhed by a ſpreading tail, in ſhape like a plume of feathers, which it raiſes above its head, and forms into a kind of ſhade for itſelf.

The ſquirrel may be ſaid to be leſs a quadruped than almoſt any other four-footed animal. It generally holds itſelf almoſt upright, uſing its fore-feet as hands for a conveyance to its mouth. Inſtead of hiding itſelf in the earth, it is continually in the air. It ſomewhat reſembles the birds by its lightneſs and activity; like them, it reſts upon the branches of trees; leaping from one to the other, and in the higheſt of them builds its neſt. It avoids the water ſtill more than the earth; and it is even aſſerted of this animal, that, when it is obliged to croſs a river or ſtream, it uſes the bark of a tree, or ſome ſuch light woody ſubſtance, as a boat, while its tail ſupplies the place of ſails, and of a rudder. It collects a quantity of nuts during the ſummer, which it depoſits in the hollow part of ſome old tree, and to which it has recourſe for proviſion in winter; and ſuch is the agility of its body, that it will, in an inſtant, climb the moſt ſmooth beech-tree.

There are many ſpecies which approach to that of the ſquirrel, though there are few varieties in the ſpecies itſelf. There are ſome of an aſh-colour, and all the reſt are red. The ſmall grey ſquirrel is of a different ſpecies, and remains always grey. The flying ſquirrels, are very different from the reſt. The white ſquirrel of Cambaye, is very ſmall, and has a tail like that of the European ſquirrel. That of Madagaſcar, called *Tſitſihi*, is grey, and according to Flaccourt is neither handſome nor fit to be tamed. The white ſquirrel of Siam; the grey, and ſpotted, ſquirrel of Bengal; the ſtreaked ſquirrel of Canada; the black ſquirrel; the large grey Virginian ſquirrel; the white-ſtripped ſquirrel of New Spain, the white Siberian ſquirrel; the variegated ſquirrel; the little American ſquirrel; that of Braſil; that of Barbary; the *palmiſt*, &c. form ſo many ſpecies diſtinct from that which we have deſcribed.

The Rat.

If we deſcend by degrees from the great to the ſmall, from the ſtrong to the weak, we ſhall find, that Nature, attentive only to the preſervation of each ſpecies, creates a profuſion of individuals, and is ſupported by the numbers which ſhe has formed of a diminutive ſize, and to which ſhe has denied weapons, ſtrength and courage.

Under the generical name of rat, ſeveral ſpecies of ſmall animals have been compriſed. This name we ſhall ſolely appropriate to the common rat, which is of a dark colour, and infects our houſes. Each of the other ſpecies ſhall have its particular denomination; for, as neither of them couple together, each is, different from all the reſt.

This animal is carnivorous, and we may uſe the expreſſion *omnivorous*. Hard ſubſtances, however, it prefers to ſoft ones. It devours wool, ſtuffs, and furniture of all ſorts; eats through wood, makes hiding-places in walls, from whence it ſallies forth in queſt of prey, and frequently returns with as much as it is able to drag along with it, forming, eſpecially when it has young ones to provide for, a magazine of the whole. The females bring forth ſeveral times in the year, though moſtly in the ſummer ſeaſon; and they uſually produce five or ſix at a birth.

In defiance of the cats, and notwithſtanding the poiſon, the traps, and every other method that is uſed in deſtroying theſe creatures, they multiply ſo faſt as frequently to do conſiderable damage. In old houſes, in the country eſpecially, where great quantities of corn are kept, and where the neighbouring barns and hay-ſtacks favour their retreat, as well as their multiplication, they would often become dangerouſly numerous, were they not to devour each other. This we have often found to be the caſe when they have been ſtraitened for proviſions; and the method they take to leſſen their numbers, is, for the ſtronger to diſpatch the weaker. After this, they lay open their ſkulls, and firſt eat up the brains, and afterwards the reſt of the body. Next day, hoſtilities are renewed in the ſame manner; nor do they ſuſpend their havock till the majority are deſtroyed. Hence it is, that, after any place has for a long time been infeſted with rats, they often ſeem to diſappear of a ſudden, and ſometimes for a conſiderable while.

The female always prepares a bed for her young, and provides them immediately with food. On their firſt quitting the hole, ſhe watches over, defends, and will even fight the cats, in order to protect them. The weaſel, though a ſmaller animal, is, however, a ſtill more formidable enemy than the cat. The rat cannot inflict any wounds but by ſnatches, and with its fore-teeth, which, however, being rather calculated for gnawing than for biting, have but little ſtrength. The weaſel, on the other hand, bites fiercely with the force of its whole jaw at once, and, inſtead of letting go its hold, ſucks the blood through the wound.

In every conflict with an enemy ſo dangerous, it is no wonder, therefore, that the rat ſhould fall a victim.

There are many varieties in this ſpecies. Beſide the common black rat, there are ſome which are brown, and ſome almoſt black; ſome which are grey, inclining to white or red, and ſome perfectly white. The white rat, like the white mouſe, the white rabbit, and all other animals which are entirely of that colour, has red eyes. The white ſpecies, with all its varieties, appears to belong to the temperate climates of our continent, and are found in greater numbers in hot countries than in cold ones. Originally they had no rats in America; and thoſe which are to be found there at preſent, are the produce of rats which accidentally obtained a footing on the other ſide of the Atlantic with the firſt European ſettlers. Of theſe the increaſe was ſo great, that the rat was long conſidered as the peſt of the colonies; where, indeed, it had hardly an enemy to oppoſe it but the large adder, which ſwallows it up alive. The European ſhips have likewiſe carried theſe animals to the Eaſt Indies, into all the iſlands of the Indian Archipelago, as well as into Africa, where they are found in great numbers. In the North, on the contrary, they have hardly multiplied beyond Sweden; and thoſe which are called Norwegian and Lapland rats, are animals different from ours.

The Mouſe.

The Mouſe is an animal ſmaller than the rat. Its inſtinct, its temperament, its diſpoſition, is the ſame; nor does it materially differ from the rat, but by its weakneſs, and the habits which it contracts from that circumſtance. By nature timid, by neceſſity familiar, its *fears* and its *wants* are the ſole ſprings of its actions. It never leaves its hiding-place but to ſeek for food; nor does it, like the rat, migrate from one houſe to another, unleſs compelled by neceſſity. Its manners are milder; and, to a certain degree, it may be tamed. It is, however, utterly incapable of attachment.

If it were not its immenſe fecundity, the ſpecies of the mouſe could not ſubſiſt. Even in mouſe-traps I have known them to bring forth. They produce at all ſeaſons, and ſeveral times in the year. Their uſual number at a birth is five or ſix, which, in leſs than fifteen days, attain ſtrength ſufficient to ſhift for themſelves. As in theſe reſpects they ſo ſoon attain perfection, ſo the duration of their life muſt be very ſhort; a circumſtance which cannot but heighten our idea of their prodigious multiplication. Ariſtotle tells us, that, having put a pregnant mouſe into a veſſel of corn, he ſoon after found in it one hundred and twenty mice.

The Long-tailed Field-Mouſe.

The Long-tailed Field Mouſe is ſmaller than the rat, but larger than the common mouſe, and does not live in houſes. It is remarkable for the largeneſs and prominence of its eyes. It differs too both from the rat and the mouſe in the colour of its ſkin, which, while it is tolerably white under the belly, is of a reddiſh brown upon the back. The ſpecies is generally and abundantly diffuſed.

The largeſt are above four inches from the tip of the noſe to the root of the tail; and the ſmalleſt, which appear to be full grown as well as the others, are an inch ſhorter. Although many are found of different intermediate ſizes, the larger and the ſmaller are all of the ſame ſpecies.

Theſe creatures are fond of dry and elevated grounds. In woods, and in the fields adjoining to them, they are to be found in great numbers. They conceal themſelves in holes, which they either find already made, or which they make for themſelves, under buſhes, or the trunks of hollow trees. In theſe they amaſs ſo prodigious a quantity of acorns, nuts, &c. that in one hole there has been found a buſhel at a time. Theſe holes are generally more than a foot under ground, and often divided into two cells, of which the one ſerves for an habitation for itſelf and its young ones, and the other for a granary. I could never find any other method of preventing their ravages, than that of ſetting traps at every tenth pace through the whole extent of each piece of new-ſown land.

The Water-Rat.

The Water-Rat is a little animal, about the ſize of a common rat, but in its nature and habits it is more like the otter than the rat. Like the otter, it frequents the freſh waters, and is generally found on the borders of rivers, rivulets and ponds. Like that creature, too, it ſeldom feeds but upon fiſh, or the ſpawn of fiſh, though ſometimes it eats frogs, water-inſects, and even roots and herbs. This animal is not web-footed; but, though every toe of its feet is ſeparated, it ſwims with eaſe, keeps itſelf a long time above water, and thence carries off its prey.

The head of the water-rat is ſhorter, the noſe broader, the hair more erect, and the tail much longer than that of the land rat. Like the otter, it flies from large rivers, or rather from thoſe which are too much frequented, and is never found either in houſes or in barns.

It is probable, that theſe animals bring forth often in a year; but of this we have no certain information. Their fleſh is not abſolutely bad; and, in Catholic countries, the peaſants eat it during Lent, as they do that of the otter. The ſpecies is to be found throughout Europe, the extremities of the North excepted.

The Short-tailed Field-Mouſe.

The ſhort tailed Field-mouſe is ſtill more generally diffuſed than the long-tailed kind, and is found almoſt every where; in woods, in meadows, and even in gardens. It is remarkable for the thickneſs of its head, and the ſhortneſs of its tail, which is not above an inch long. It forms holes in the earth, where it hoards up corn, nuts, and acorns; the former of which it prefers to every other kind of food. About the month of July, when the corn begins to ripen, they flock together from every quarter, and frequently do great damage, by cutting the ſtalk in order to come at the ear. In autumn and winter, the greater part of them retire to the woods, where they find beech-maſt, nuts and acorns. Some years they appear in ſuch numbers, that they would deſtroy every thing, were they to ſubſiſt long. For want of other food, however, they often eat one another, and are themſelves the uſual prey of the fox, the wild-cat, the martin, the weaſel, and of the long-tailed field-mouſe.

The Guinea-Pig.

The Guinea-Pig, though originally a native of the warm climates of Braſil and Guinea, lives, however, and breeds in temperate and even in cold countries, provided it is properly taken care of. Its ſkin is of little or no value; and the fleſh, though people may eat it, is very indifferent food. Their fleſh, however might be rendered better, if they were reared in warrens, and had a proper choice of herbs.

The growth of theſe animals is not entirely completed till the end of eight or nine months. The female never goes with young above three weeks; and ſhe has been known to bring forth when only two months old. The firſt litter does not amount to more than four or five. The ſecond amounts to five or ſix, and the reſt to ſeven or eight, and even to ten or eleven. She does not ſuckle her young above twelve or fifteen days. In one year a thouſand might be obtained from a ſingle couple, did they not frequently deſtroy each other, and periſh from the cold and wet.

The guinea-pig feeds on all ſorts of herbs, and eſpecially on parſley, which it prefers even to bran, flour, or bread. Of apples and other fruits it is alſo exceedingly fond. Like the rabbit, it eats quickly, little at a time, but very often. It grunts ſomewhat like a young pig.

Theſe animals are ſo delicate, that it is with difficulty they ſurvive the rigours of winter. When they feel cold, they aſſemble together, preſs cloſe to one another, and in this ſituation are frequently found dead.

The Hedge-Hog.

The Hedge-Hog has the power of defending itſelf from an enemy without combating him, and of annoying without attacking him. Poſſeſſed of little ſtrength, and of no agility, by which it might eſcape its foes, it has received from Nature a prickly armour, with a facility of rolling itſelf up in a ball, and of preſenting from every part of its body a poignant weapon of defence. Even from its fear this animal obtains another engine of ſecurity. The ſmell of its urine, which, when attacked, it generally emits, is ſufficient to make its enemy quit the field. Thus the generality of dogs are content with barking at the hedge-hog, when it falls in their way, without diſcovering any inclination to ſeize it. Of theſe, however, there are ſome which, like the fox, have had the addreſs to overcome it, though of the martin, the pole-cat, the ferret, the weaſel, or any of the birds of prey, it has no dread.

They are generally found in woods, under the trunks of old trees, as alſo in the clefts of rocks. I do not believe that they climb up trees, as ſome naturaliſts have affirmed, or that they make uſe of their prickles to carry off the fruit. It is with their mouth they ſeize it; and though they are very numerous in our foreſts, yet I have never ſeen one of them upon a tree. They always remain at the foot, in ſome hollow ſpace, or under moſs. They continue in a ſtate of inactivity during the whole day; and they only venture abroad by night, but ſeldom approach human habitations. They ſleep during the winter; and therefore every thing that has been ſaid of their hoarding up proviſions for that ſeaſon muſt be falſe. They never eat much, and can ſubſiſt very long without any food whatever. Like that of all other animals which become torpid in winter, their fleſh is not proper food; nor is their ſkin of any uſe.

The Shrew-Mouſe.

The Shrew-Mouſe ſeems to fill up the vacuum between the rat and the mole. The ſhrew-mouſe is ſmaller than the domeſtic mouſe, and reſembles the mole in its ſnout, which is longer than its jaw-bones. Its eyes, though larger than thoſe of the mole, are, in like manner concealed, and much ſmaller than thoſe of the domeſtic mouſe. The number of its claws, of which it has five to each foot; its tail, and its legs, particularly the hind ones, which are ſhorter than thoſe of the domeſtic mouſe; its ears, too, and its teeth, reſemble thoſe of the mole.

This diminutive creature has a ſtrong ſmell peculiar to itſelf, and ſo offenſive to cats, that, though they will chearfully kill the ſhrew-mouſe, they will not eat it. It is evidently this noiſome odour, this averſion of the cat to it, that gave riſe to the notion, that the ſhrew-mouſe is a venomous animal, and that its bite is ſo dangerous to every kind of cattle and particularly to horſes. The truth, however, is, that it is neither venomous nor capable of biting; for it cannot open its mouth wide enough to ſeize the double thickneſs of the ſkin. The diſtemper among horſes, which the vulgar attribute to the tooth of the ſhrew-mouſe, is a ſwelling which proceeds from an internal cauſe, and has no connection with any bite, or rather ſcratch, that this little animal may give.

In winter eſpecially, the ſhrew-mouſe generally fixes its reſidence in ſome hay-loft, ſtable, or barn, where it feeds on grain, inſects, and putrefied fleſh. It is likewiſe found in woods and fields, where, living on corn, it ſometimes conceals itſelf under moſs or leaves, ſometimes under the trunks of trees, ſometimes in holes abandoned by moles, and ſometimes in holes of a ſmaller ſize, which it forms for itſelf by digging with its claws and ſnout.

The ſhrew-mouſe, is ſaid to produce as many at a birth as the domeſtic mouſe, though leſs frequently. It has a ſqueak much more piercing than the latter. In point of nimbleneſs, however, it is far inferior; and as it both ſees imperfectly, and runs ſlowly, it is eaſily taken.

The uſual colour of theſe creatures is brown with a mixture of red. Others of them there are aſh-coloured; and they all have a greater or leſs degree of whiteneſs upon the belly. They are very common throughout Europe; but they do not ſeem to have obtained a footing in America.

The Water Shrew Mouſe.

The Water Shrew-Mouſe, though a native of theſe regions, was unknown to any of our naturaliſts till M. Daubenton firſt diſcovered it. With reſpect to the *water ſhrew-mouſe*, it is taken at the ſources of fountains in the morning and evening, as the ſun riſes and ſets. In the day-time it remains concealed in the clefts of rocks, or in holes under ground, near the edges of rivulets. It brings forth in ſpring, and generally produces nine young ones at a time.

The Mole.

The Mole, without being blind, has ſuch ſmall eyes, and theſe ſo concealed, that they prove but of little uſe to it. It enjoys however the ſenſes of hearing and feeling in an eminent degree. Its ſkin is ſoft as ſilk; and its little paws, which are furniſhed with five claws, are very different from thoſe of other animals, and almoſt like the hands of a human being. Proportioned to the ſize of its body, its ſtrength is great; it poſſeſſes the mild habitudes of repoſe and of ſolitude; the art of ſecuring itſelf, of forming, inſtantaneouſly, as it were, an aſylum to itſelf, of extending it, and of obtaining, without the neceſſity of relinquiſhing it, an abundant ſubſiſtence.

The mole ſhuts up the entry to is retreat, which it ſeldom deſerts, unleſs forced to it by heavy rains in ſummer. It is fond of cultivated grounds, and is never to be found in thoſe which are either muddy, hard, compact, or ſtony. It requires a ſoft ſoil, well ſupplied with eſculent roots, and with inſects and worms, of which, indeed, its principal nouriſhment conſiſts.

As theſe animals very ſeldom come above ground, they have but few enemies; and very readily evade the purſuit of animals ſtronger and ſwifter than themſelves. The chief calamity which befals them is an inundation; and when this happens, they are ſeen in numbers attempting to ſave themſelves by ſwimming, and uſing every effort to reach the higher grounds. The greateſt part, however, periſh, as well as their young, which remain in the holes behind. Were it not for ſuch accidents, from their great fecundity, they would become extremely troubleſome. They generally have four or five at a time; and it is eaſy to diſtinguiſh among other mole-hills, that in which the female has brought forth her young. Theſe are made with much greater art than the reſt; and are uſually larger and more elevated. I am apt to think that they produce oſtener than once a year. Of this I am certain, that moles newly produced are found from the month of April to the month of Auguſt; a circumſtance which, however, may be owing to their having been engendered ſooner or later in the year.

The hole in which they produce their young is formed with ſingular ſkill, and merits a particular deſcription. The female begins by erecting the earth into a ſpacious apartment ſupported within by partitions at proper diſtances, to prevent the roof from falling. As the hillock, in which the apartment is thus formed, is raiſed above ground, the appartment itſelf is conſequently above the level of the plain, and therefore leſs ſubject to accidental ſlight inundations. The place being thus fitted, ſhe procures graſs and dry leaves, as a bed for her young. There they lie ſecure from wet, and ſhe continues to make their retreat equally free from danger. For round this hill of her own raiſing, are holes running into the earth, which part from the middle apartmant, like rays from a center, and extend about fifteen feet in every direction. Theſe reſemble ſo many walks or chaces, into which the animal makes her ſubterraneous excurſions, and ſupplies her young with ſuch roots or inſects as ſhe can provide. Beſides they contribute much to the general ſafety; for as the mole is very quick of hearing, the inſtant ſhe preceives her little habitation attacked, ſhe takes to her burrow, and unleſs the earth be dug away by ſeveral men at once, ſhe and her young always make good a retreat.

Some authors have ſaid, but without foundation, that the mole and the badger ſleep the whole winter. That this is not true of the badger, we have already obſerved. And as a proof that the mole quits its hole in winter as well as in ſummer, we have only to view the traces it leaves upon the ſnow. The mole is ſo far from ſleeping during the winter, that it continues its ſubterranean operations then as well as in ſummer; and the peaſants of France even proverbially remark, that "when the moles are at work, a thaw is at hand." They are indeed fond of warm places; and the gardeners often catch them round their hot beds in the months of December, January, and February.

The Bat.

An animal, which, like the bat, is half-quadruped and half-bird, and which, in fact, is neither the one nor the other, is a kind of monſter.

ſter. In the bat, the fore-feet are, properly ſpeaking, neither wings nor feet, though the animal uſes them both for the purpoſe of flying, and walking. They are, in fact, two ſhapeleſs extremities, of which the bones are of a monſtrous length, and connected by a membrane, neither with feathers, nor hair. They are a kind of winged paws, of which we only ſee one claw about the length of an inch, and of which the other four claws, though very long, cannot act but in conjunction, and have no peculiar movements, no ſeparate functions. They are a kind of hands ten times larger than the feet, and, in all, four times longer than the whole length of the body of the animal. In ſhort they are parts which have rather the appearance of a capricious and accidental, than of a regular and determined production.

To theſe incongruities, theſe diſproportions of the body and members, may be added the ſtill more ſtriking deformities of the head. In ſome ſpecies, the noſe is hardly viſible, the eyes are ſunk near the tip of the ear, and are confounded with the cheeks. In others, again, the ears are as long as the body, or elſe the face is twiſted into the form of an horſe-ſhoe, and the noſe covered with a kind of cruſt. Averſe, likewiſe, to the ſociety of all other creatures, they ſhun the light, inhabit none but dark and gloomy places, to which, after their nocturnal excurſions, they are ſure to return by break of day, and in which they remain, fixed, as it were, to the walls till the approach of night.

Their motion in the air may be termed an uncertain flutter, which they ſeem to execute by ſtruggles, and in an awkward manner. They raiſe themſelves from the ground with difficulty, never ſoar to a great height, and are but imperfectly qualified to accelerate, or even to direct their flight. This, far from being either rapid, or very direct, is performed by haſty vibrations in an oblique and winding direction; and in paſſing along they do not fail to ſeize all the gnats, moths, and other nocturnal inſects that come in their way. Theſe they ſwallow entire; and in their excraments we meet with the remains of wings and other dry parts, which they have not been able to digeſt. Like quadrupeds, the bat brings forth her young alive, and like them it has teeth and nipples.

Theſe animals do not produce more than two at a birth, which they ſuckle, and even carry along with them as they fly. They unite in numbers to defend each other from the cold. They paſs the winter without awaking, without ſtirring, and without eating, from the end of autumn till ſpring. Notwithſtanding they can more eaſily ſupport hunger than cold, and can even ſubſiſt a number of days without food, they belong to the number of carnivorous animals; for they will devour bacon and meat of all kinds.

The Fat Squirrel.

Of this animal we know three ſpecies, which, like the marmot, ſleep during the winter; namely, the fat ſquirrel, the garden ſquirrel and the dor-mouſe. Many authors have confounded theſe ſpecies together, though they are all three very different, and of conſequence eaſily known and diſtinguiſhed.

The fat ſquirrel is nearly of the ſize of the common ſquirrel, and, like it, its tail is covered with long hair. It is without foundation that theſe animals have been ſaid to ſleep during the winter. They are not in a ſtate of natural ſleep at this period. They are in a torpor, which is produced by the coldneſs of the blood, and by which they loſe the uſe of their members and ſenſes. Their internal heat is indeed ſo ſmall, that it hardly exceeds that of the temperature of the air. When the heat of the air is at ten degrees above the freezing point of the thermometer, the heat of theſe animals is alſo at ten degrees. Now it is well known, that the internal heat of man, and of the moſt of animals, always exceeds thirty degrees; there is little reaſon therefore to wonder that theſe animals, ſo inferior comparatively to all others in point of heat, ſhould become torpid as ſoon as their own little quantity of internal heat ceaſes to be aſſiſted by the external heat of the air. This circumſtance, however, naturally happens when the thermometer is not more than ten or eleven degrees above congelation. This is the real cauſe of the torpor of theſe animals; a cauſe of which naturaliſts have not been appriſed, and which, nevertheleſs, extends to all animals that ſleep during the winter.

This torpor continues as long as the cauſe which produces it continues to operate, and ceaſes when the cold ceaſes. A few degrees of heat above the tenth or eleventh degree are ſufficient to re-animate theſe creatures; and if they are kept in a very warm place during the winter, they do not become torpid.

Though in this torpid ſtate, they are without the ſmalleſt motion, though their eyes are ſhut, and they ſeem to be deprived of all uſe of the ſenſes, they yet feel pain when it is very acute. This they teſtify by a movement of contraction, as alſo by a little hollow cry, which they even repeat ſeveral times. I am inclined to believe, that it is not from a too great waſte of ſubſtance that they periſh in long winters, ſince in autumn they are exceſſively fat, and on their reviving in ſpring, they are found to have ſtill remained ſo. This abundance of fat is an internal nouriſhment which is ſufficient to ſupport them, and to ſupply what they loſe by perſpiration.

The fleſh of the fat ſquirrel is not unlike that of the guinea-pig. They were conſidered as a luxury by the Romans, who reared great numbers of them. Like the common ſquirrel, this animal lives in foreſts, climbs to the tops of trees, and leaps from branch to branch. This it does leſs nimbly indeed than the ſquirrel, whoſe legs are longer, whoſe belly is by no means ſo big, and which is remarkable for being meagre. Nuts, however, and other wild fruits, form its uſual nouriſhment. It likewiſe eats little birds which it takes in the neſts. It does not, like the ſquirrel, neſtle in the upper parts of trees, but makes a bed of moſs for itſelf in the trunks of thoſe which are hollow. It alſo ſhelters itſelf in the clefts of rocks, and always ſhews a preference for dry places. It avoids moiſture, it drinks little, rarely deſcends to the ground, and, unlike the ſquirrel, which is eaſily tamed, remains always wild. The ſpecies is very generally diffuſed, but there are few or none of them in England.

The Garden Squirrel, or Greater Dormouſe.

The fat ſquirrel frequents the foreſts, and ſeems to ſhun our habitations. The garden ſquirrel, on the contrary, inhabits our gardens, and is ſometimes in our houſes. The ſpecies of the latter is alſo more numerous and more generally diffuſed.

Theſe animals neſtle in the holes of walls, climb up trees, ſelect the beſt fruits, and gnaw them as they begin to ripen. They climb up pear, apricot, and other trees; and in a ſcarcity of other fruit, they eat almonds, nuts, and even leguminous roots. Theſe they carry in great quantities to their holes, where they make a bed of herbs, moſs, and leaves. The cold ſtupefies, the heat revives them; and ſometimes there are eight or ten found in one place, all in a ſtate of torpor, all huddled together, and rolled up in a ball, in the midſt of their hoard of proviſions. Their fleſh is not palatable, and has even the diſagreeable ſmell of the houſe-rat.

This animal is to be found in all the temperate climates of Europe, and even in Polland, and in Pruſſia; but it does not appear that there are any in Sweden, or in any of the more northern countries.

The Dormouſe.

Of all the rat ſpecies, the dormouſe is the leaſt ugly. Its eyes are ſparkling, its tail is tufted, and its hair is rather fair than red. It never lives in houſes. It is ſeldom to be found in gardens, but chiefly frequents the woods, where it finds a ſhelter in the hollow of ſome old tree.

The ſpecies is by no means numerous, yet they ſeem to be tolerably common in Italy, and to be known even in the northern climates; but it does not appear to be an Engliſh animal; for Ray, who had ſeen it in Italy, obſerves, that the ſmall dormouſe which is found in England, is not red upon the back like the Italian, and that it probably belongs to another ſpecies.

The dormouſe becomes torpid by the cold, and rolls itſelf up in a ball; it revives in mild weather, and hoards up nuts and other dry fruits for future ſuſtenance. It forms its neſt in trees, like the ſquirrel, though generally in a lower ſituation, among the branches of a nut tree, in a buſh, &c. The neſt is compoſed of herbs interwoven, and is about ſix inches in diameter, has no aperture but at the top, and contains three or four young ones.

The Brown Rat.

The brown rat is both ſtronger and more miſchievous than the black rat. It has a reddiſh ſkin, a long tail without hair, the back-bone arched like that of the ſquirrel, the body much thicker, and whiſkers like thoſe of a cat. It is not half a century ſince this ſpecies has been found in the neighbourhood of Paris. They multiply indeed prodigiouſly, for they generally produce twelve or fifteen, often ſixteen, ſeventeen, eighteen, and even nineteen young ones at a time. The males are larger, ſtronger, and more miſchievous than the females. When any one purſues, and endeavours to take them, they will turn again, and bite the hand or ſtick which touches them. Their bite is not only ſharp but dangerous, and is immediately followed by a conſiderable ſwelling. They bring forth thrice every year, the dams previouſly preparing a bed for their young; and thus two individuals of this ſpecies produce at leaſt three dozen in the ſpace of twelve months.

The brown rat in its nature, and ſome of its habitudes, bears a reſemblance to the water-rat. Though there is no place but in which they will reſide, they ſeem to delight in living near the water. When they find themſelves purſued, and have the ſame opportunity of ſheltering themſelves in the water, or in a thorny thicket, they prefer the former, plunge into it without dread, and ſwim with amazing dexterity. This particularly happens when they cannot get back to their burrows; for they always dig holes for themſelves in the earth, or elſe occupy thoſe of the rabbit. They may alſo be taken, like that animal, by the ferret, which follows them under ground as it does the rabbit, and even with more ardour.

Theſe animals live principally upon fruit and corn, but are, notwithſtanding, exceedingly carnivorous. They devour young rabbits, partridges, and other birds; and when they enter a hen-rooſt, they deſtroy, like the pole-cat, more than they eat. They do not become torpid in the winter, like the dormouſe, but take advantage of every fine day to come out of their ſubterranean manſions. Thoſe which live in barns, drive away the mice; and it has even been remarked, that the black rats, as they are called, have been far leſs common ſince the brown rats became ſo numerous.

The Marmot.

The Marmot, when taken young, is more capable of being tamed than any other wild animal, and nearly as much ſo as our domeſtic ones. It will eaſily learn to perform feats with a ſtick, to dance, and to obey the voice of its maſter. It bears a great antipathy at the dog; and when it becomes familiar in a houſe, and is certain of being ſupported by its maſter, it will, in his preſence, attack the largeſt dogs, and boldly faſten upon them with its teeth. Though this creature is not quite ſo large as a hare, it is of a more ſquat make, and has great ſtrength joined to great agility. It has four teeth in the front of the jaw, which are long and ſtrong enough to inflict a terrible wound; and yet, unleſs provoked to it, it neither attacks dogs, nor does miſchief to any other creature. If care be not taken, however, it will gnaw the furniture of an houſe, and will even make holes through wooden partitions.

As the marmot has very ſhort thighs, and the toes of its paws are formed much like thoſe of the bear, ſo it often ſits erect, and walks with eaſe, like that animal, upon its hind feet. With its fore-paws it carries its food to its mouth, and eats in an upright poſture like the ſquirrel. It runs much ſwifter up hill than down; it climbs trees, and runs up the clefts of rocks, or the contiguous walls of houſes, with great eaſe. Indeed, it is ludicrouſly obſerved of the Savoyards, who are the general chimney-ſweepers of Paris, that they have learned their trade from the marmot.

Theſe animals eat whatever is given them, whether it be fleſh, bread, fruits, herbs, roots, pulſe, or inſects. Of milk and butter, however, they are particularly fond; and though leſs inclined to petty thefts than the cat, they are never better pleaſed than when they obtain acceſs to the dairy.

There ſeems to be a combination of the bear and the rat in the form of the marmot. Its noſe, its lips, and the form of its head, are like thoſe of the hare; it has the hair and claws of the badger, the teeth of the beaver, the whiſkers of the cat, the paws of the bear, with a tufted tail and ſhort ears. The colour of its hair on the back is reddiſh brown. On the belly it is reddiſh, but ſofter and ſhorter. Its voice reſembles that of a little dog, when it is careſſed; but when it is irritated or frightened, it raiſes a loud and ſhrill cry, highly offenſive to the ear. The marmot is a very cleanly animal. In autumn particularly it is loaded with fat, though all the parts of the body are never equally ſo. The marmot, would be tolerable food, had it not an offenſive ſmell.

This animal, which delights in the regions of ice and ſnow, and is never found but on the higheſt mountains, is, nevertheleſs, moſt liable to be benumbed by the cold. From the end of September, or the beginning of October, the marmot generally retires to its hole, and does not return till about the beginning of April. The place of its retreat is formed with precaution, and furniſhed with art. It is rather wide than long, and very deep, ſo that it is capable of containing ſeveral, without being under a neceſſity of crowding each other, or injuring the air they breathe. Their feet and claws are formed as they were deſigned to dig; and, in fact, they burrow into the ground with amazing celerity, ſcraping up the earth, and throwing back what they have looſened behind them conſtantly as they proceed. Still more wonderful is the form of their hole; it reſembles the letter Y, the two branches having each an opening that conducts into one channel, which terminates in their apartment at the bottom. As the whole is contrived on the declivity of a mountain, there is no part of it on a level but the apartment at the end. One of the branches, or openings, iſſues out ſloping downward; and this ſerves as a kind of ſink, or drain, for the whole family, in which they void their excrements, and through which the moiſture of the place finds an eaſy paſſage. The other branch, on the contrary, ſlopes upward, and ſerves them for a door. The apartment at the end is warmly lined with moſs and hay. It is even aſſerted, that this work is carried on by the whole company; that ſome cut the fineſt graſs, others pile it up, and others take their turns to convey it to the hole. Upon this occaſion, it is added, one of them lies upon its back, permits the hay to be heaped upon its belly, keeps its paws upright to make greater room, and in this manner, remaining ſtill upon its back, is dragged by the tail, hay and all, to their common retreat. This practice ſome aſſign as a reaſon for the hair being generally worn away from their backs. However another, and perhaps a better reaſon can be given for this appearance; namely, their inhabiting cells under ground, and being conſtantly employed in digging up the earth. Whenever they venture abroad, one is placed as a centinel, ſitting on an elevated rock, while the others amuſe themſelves in the fields below, or are employed in cutting graſs, and making it into hay for their future convenience. And no ſooner does their centinel perceive a man, an eagle, a dog, or any other enemy, than he informs the reſt by a kind of whiſtle, and is himſelf the laſt that takes refuge in the cell.

They make no proviſion for the winter. But when they perceive the firſt approaches of the ſeaſon in which their vital motions are to continue in ſome meaſure ſuſpended, they labour very diligently to cloſe up the apertures of their dwellings, which they effect with ſuch ſolidity, that it is more eaſy to open the earth in any other part than where they have cloſed it. They are at that time very fat, and ſome of them are found to weigh twenty pounds. In this plight they continue for three months longer; but by degrees their fleſh begins to waſte, and they are quite thin by the end of winter. When their retreat is diſcovered, they are found each rolled into a ball, and covered with hay. In this ſtate they ſeem entirely lifeleſs. They may be taken away, and even killed, without betraying any ſymptom of pain;

and thoſe who find them in this manner, carry home the fat ones for food, and the young ones in order to rear and tame them. The marmot produces but once a year, and the litter generally conſiſts of three or four. The growth is quick, and they live only nine or ten years. They are found in the Alps, Appenines, Pyrenees, in the higheſt mountains of Germany, in Poland, and in Canada, with a few variations.

CHAP. XIII.

OF CARNIVOROUS ANIMALS CONTINUED—THE BEAR—THE BEAVER—THE RACOON—THE COATI—THE AGOUTI.

The Bear.

THERE is no animal more generally known than the bear, and yet there is none about which the writers of natural hiſtory are leſs agreed. Theſe uncertainties have ariſen from their not diſtinguiſhing properly the different ſpecies. The land-bear muſt be diſtinguiſhed from the ſea-bear, which is commonly known by the name of the white, or Greenland bear. The land-bears muſt again be divided into two claſſes, the brown, and the black. There are ſome white land-bears found in Tartary, Ruſſia, &c. which, though they reſemble the ſea-bear in colour, differ from it, however, in every other particular. It is not the rigour of the climate that makes them white in winter, like the hares and ermines; they are brought forth white, and always remain ſo. There are alſo bears whoſe ſkins are a mixture of brown and black, which denotes an intermediate ſpecies between the white land-bear, and the brown or black bear.

We meet with the brown bear very frequently, and with the black bear very rarely, on the Alps. In the foreſts of the northern countries of Europe and America, on the contrary, the black bear is very common. The former is both fierce and carnivorous; the latter is only fierce, and conſtantly refuſes to eat fleſh.

The bear is not only a ſavage, but a ſolitary animal; he takes refuge in the moſt unfrequented parts, and the moſt dangerous precipieces of uninhabited mountains. He makes his den in the moſt gloomy parts of the foreſt, in ſome cavern that has been hollowed by time, or in the hollow of ſome old enormous tree. Thither he retires alone, and paſſes a part of the winter without proviſions, or without ever ſtirring abroad. He is not, however, entirely deprived of ſenſation, like the dormouſe, or the marmot, but ſeems rather to ſubſiſt upon the exuberance of his former fleſh, and only feels the calls of appetite, when the fat he had acquired in ſummer begins to be entirely waſted.

When this happens, which, we are told, it generally does after forty or fifty days, the male forſakes his den; but the female remains confined for four months, till ſhe has brought forth her young. That the latter ſhould not only be able to ſubſiſt but even to nurſe their offspring, without taking any food during that time, is, I think, highly improbable. When with young, however, it is allowed that they are exceedingly fat, as alſo, that, being covered with a very thick coat, ſleeping the greateſt part of their time, and taking no exerciſe or motion, they muſt neceſſarily loſe very little by perſpiration.

Though the males of the brown ſpecies devour their young, when they find an opportunity for it, yet the females ſeem, on the contrary, to love them with a ferocious diſtraction. When once they have brought forth, their fury is more violent, as well as more dangerous, than that of the males. Before the young leave the womb, their formation is perfect; and if either the fœtus of the bear, or the bear when newly yeaned, appears, at the firſt glance, unformed, it is merely becauſe there is a want of proportion in the body and members even of the grown bear, and becauſe, which is well known to be the caſe in all animals, the fœtus, or the new produced animal, is always more diſproportioned than the grown one.

The voice of the bear is a kind of growl, a harſh murmur, which, when enraged, is heightened by a claſhing of the teeth. Highly ſuſceptible of anger, that anger is always furious, and often capricious. However mild he may appear before his maſter, and even obedient when tamed, he ought ſtill to be diſtruſted, ſtill treated with circumſpection. It is moſt dangerous to ſtrike him on the tip of the noſe, or to touch him on the parts of generation.

He is capable of ſome degree of inſtruction. There are few who have not ſeen him ſtand on his hind legs, or dance in rude and awkward meaſure, to tunes either ſung or played on an inſtrument. But, even in thus tutoring him, it is neceſſary, in order to ſucceed, that he ſhould be taken young, and held in conſtraint ever after. The bear which has paſſed his youth, is not to be tamed nor even held in awe, and ſhews himſelf, if not intrepid, at leaſt fearleſs of danger.

The wild bear turns not from his path, nor offers to ſhun the ſight of man. It is ſaid, however, by a certain whiſtle he may be ſo far charmed as to ſtop, and ſtand upon his hind feet. This is the time to ſhoot him; for, when only wounded in an attack, he darts with fury at his foe, and, claſping him with his fore paws, is ſure to ſtifle him, unleſs immediate aſſiſtance be given.

The bear enjoys the ſenſes of ſeeing, hearing, and feeling, in great perfection; and yet, compared with the ſize of his body, his eye is very ſmall. His ears are alſo ſhort, his ſkin is coarſe, and his hair very thick. his ſmell is exquiſite; more ſo, perhaps, than that of any other animal, the internal ſurface of his noſe being very extenſive, and excellently calculated to receive the impreſſion of ſmells. He ſtrikes with his paws as a man ſtrikes with his fiſts; but in whatever he may bear a rude kind of reſemblance to the human ſpecies, he does not gain by this the leaſt aſcendancy over other animals.

The Beaver.

In all countries, as man is civilized and improved, the lower the ranks of animals are depreſſed and degraded. Either reduced to ſervitude, or treated as rebels, all their ſocieties are diſſolved, and all their united talents rendered ineffectual. Their feeble arts quickly diſappear; and nothing remains but their ſolitary inſtincts, or thoſe foreign habitudes which they receive from human education.

The beaver ſeems to be now the only remaining monument of that kind of intelligence in brutes, which, though infinitely inferior, as to its principle, to that of man, ſuppoſes, however, certain common projects,

jects, has certain relative ends in view. Projects which, having ſociety for their baſis, ſuppoſe ſome particular method of underſtanding one another, and of acting in concert.

It is allowed, that the beaver, far from having an abſolute ſuperiority over the other animals, ſeems, on the contrary, to be inferior to ſome of them. This fact I have an opportunity to confirm, having, for near a twelvemonth paſt, had a young beaver in my poſſeſſion, which was ſent to me from Canada in the beginning of the year 1758. It is an animal tolerably mild, tranquil and familiar, though rather, it would ſeem, gloomy and melancholy. If we conſider this animal, therefore, in its diſperſed and ſolitary ſtate, we ſhall find, that, as to internal qualities, it is not ſuperior to other animals. It has not more ingenuity than the dog, more ſenſe than the elephant, or more cunning than the fox. It is rather remarkable for the ſingularities of its external conformation than for any apparent ſuperiority of its internal qualities. Of quadrupeds, the beaver alone has a flat oval tail, covered with ſcales, which ſerves as a rudder to direct its motions in the water. It is the only quadruped that has membranes between the toes on the hind feet, and at the ſame time none on the fore ones, with which it conveys its food to its mouth. It is the only one which, while it reſembles a terreſtrial animal in its fore parts, ſeems to approach the nature of an aquatic being in its hind ones.

The beavers begin in the month of June or July, to form a ſociety, which is to continue for the greateſt part of the year. They arrive in numbers from every ſide, and preſently form a company of two or three hundred. The place of meeting is commonly the place where they fix their abode, which is always by the ſide of ſome lake or river. If it be a lake in which the waters are always upon a level, they do not build a dam; but if it be a running ſtream, they build a dam, or pier, a-croſs the river. This dam, or pier, is often four-ſcore or an hundred feet long, and ten or twelve feet thick at the baſe. If we compare the greatneſs of the work with the powers of the architect*, it will appear enormous; but the ſolidity with which it is built, is ſtill more aſtoniſhing than its ſize. The part of the river over which this dam is uſually built, is where it is moſt ſhallow, and where ſome great tree is found growing by the ſide of the ſtream. This they make choice of for the principal part in their building; and, though it is often thicker than a man's body, they ſoon cut it down. For this operation they have no other inſtrument than their four inciſive teeth, with which they make it fall always acroſs the ſtream. They then ſet about cutting the top branches, to make it lie cloſe and even, and ſerve as the principal beam for their fabric.

Theſe operations are performed in common. At one time a number of beavers are employed together at the foot of the tree in gnawing it down; and, when this part of their labour is finiſhed, it becomes the buſineſs of others to ſeparate the branches, while a third party are engaged along the banks of the river, or lake, in cutting other trees, which, though ſmaller than the firſt, are yet as thick as the leg, if not the thigh, of a common-ſized man. Theſe they carry with them by land to the brink of the river, and then by water to the place allotted for their building; where, ſharpening them at one end, and forming them into ſtakes, they drive them into the ground, at a ſmall diſtance from each other, and fill up the vacant ſpaces with pliant branches. While ſome are thus employed in faſtening the ſtakes, others go in ſearch of clay, which they prepare for their purpoſe with their tails and their feet, and with which, they render their ſtructure ſtill more compact.

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* The largeſt beavers weigh from fifty to ſixty pounds, and, in length, are little more than three feet from the tip of the ſnout to the inſertion of the tail.

This ſtructure is ſo ingeniouſly contrived, that it has not only all the extent, and all the ſolidity, which are requiſite, but alſo a form the moſt proper for confining the water, and, when it has paſſed its bounds, for maintaining its weight, or baffling its attack. At the top of their dike or mole, where it is leaſt thick, they form two or three openings. Theſe they occaſionally enlarge or contract, as the river occaſionlly riſes or falls; and when, from inundations or torrents, their works have been damaged, they immediately repair them with the utmoſt care.

After this diſplay of their labours to accompliſh a public work, it would be ſuperfluous to add to it a deſcription of their private conſtructions, were it not that, in hiſtory, an account ſhould be given of every fact, and that, in this firſt grand work of the beaver, the intention uniformly was, that the little habitation of each family ſhould be rendered more commodious.

This habitation is always furniſhed with two paſſages; one for the purpoſe of a land, and the other for that of a water excurſion. In ſhape it is almoſt always either oval or round; ſometimes it is from four to five feet in diameter, and ſometimes it conſiſts of two, and even three ſtories, while the walls are always two feet thick. When it happens to conſiſt of but one ſtory, the walls are but a few feet high, there is a kind of vault over them, that ſerves as a covering for the edifice. It is conſtructed with ſuch ſolidity as to be impenetrable to the heavieſt rains, to defy the moſt impetuous winds, and is plaiſtered with ſuch neatneſs, both without and within, that it might naturally be thought an effort of human ſkill. Theſe animals, neverthel eſs, uſe no inſtrument for the preparation of their mortar, but their feet, or for the application of it, but their tails. They make the greateſt uſe of ſuch materials as are not eaſily diſſolved by water. Their wooden work conſiſts of ſuch trees as grow on the banks of rivers, as theſe are moſt eaſily cut down, ſtripped of their bark, and carried; and all theſe operations they perform before they relinquiſh a tree which they have once attacked. They cut it at the diſtance of a foot or a foot and a half from the ground. They ſit as they work; and, beſides the advantage of this convenient poſture, they have the pleaſure of continually gnawing freſh bark and ſoft wood, both which they prefer to moſt other kinds of aliment. Averſe to dry wood, they always provide an ample ſtore of theſe for their ſubſiſtence during winter*. Near their habitations they eſtabliſh their magazines; and to each hut or cabin there is one allotted, of a ſize proportioned to the number of its inhabitants, to which they have all a common right; nor do they attempt to plunder their neighbours.

Hamlets, to uſe the expreſſion, have been ſeen, compoſed of twenty and even twenty-five dwellings. Such large ſettlements, however, are rare. In general, they do not contain more than ten or a dozen families, each of which has its own ſeparate diſtrict, magazine, and habitation; nor will it allow any ſtrangers to ſettle within its incloſure. The ſmalleſt dwellings contain two, four, and ſix; the largeſt, eighteen, twenty, and even thirty beavers; and it ſeldom or never happens, that the number of males and females is not pretty equal. Their ſociety therefore may be ſaid to conſiſt frequently of one hundred and fifty or two hundred workmen, who, having firſt exerted their united induſtry and deligence in rearing a grand public work, afterwards form themſelves into different bodies, in order to conſtruct private habitations.

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* The ſpace allotted for the proviſion of eight or ten beavers, occupies from twenty-five to thirty feet ſquare, and from eight to ten feet deep.

However numerous the republic of beavers may be, peace and good order are uniformly maintained in it. A common ſeries of toil has cemented their union. The conveniencies which they have procured for each other, and the abundance of proviſions which after having amaſſed, they continue to conſume together, render them happy within themſelves. Having moderate appetites, entertaining even an averſion to blood and carnage, they have not the ſmalleſt propenſity to hoſtility or rapine, but actually enjoy all the bleſſings which man is only born to deſire. Friends to each other, if threatened by any enemies from abroad, they know how to avoid them; and for this purpoſe, on the firſt alarm, they give notice of their mutual danger, by ſtriking the water with their tail, which emits a ſound that is heard in their moſt diſtant dwellings. On this occaſion, each beaver, as he thinks moſt expedient, plunges into the water, or conceals himſelf within the walls of his own habitation, which is in no danger but from the fire of the heavens, or from the weapons of man.

Theſe aſylums are not only ſecure, but alſo very neat and commodious. The floor is covered with verdure. Young and tender branches of trees ſerve them for a carpet, on which they never permit any of their excrements to be left. The window which fronts the water ſerves them for a balcony, from which they enjoy the freſh air, and bathe themſelves the greateſt part of the day. In the water they remain in an upright poſture, the head and fore parts only being viſible. This element is, indeed, ſo neceſſary to them, or rather gives them ſo much pleaſure, that they ſeem unable, as it were, to live without frequent immerſions in it. Sometimes they go to a conſiderable diſtance under the ice; and then it is eaſy to take them if we attack the dwelling and wait for them, at the ſame time, at a hole which is purpoſely formed a little way off in the ice, and to which they are obliged to come for breath.

The habit which this animal has, of continually keeping the tail, and all the hind parts of the body in the water, ſeems to have changed the nature of its fleſh. That of the fore parts, till we come to the reins, is of the ſame quality, taſte, and conſiſtency, as the fleſh of land-animals; and of the tail, and of the hind legs and thighs, has the ſmell, the ſavour, and all the qualities of fiſh. As for the tail in particular, it is an extremity of a fiſh fixed to the body of a quadruped. In length it generally meaſures a foot, in thickneſs an inch, and in breadth five or ſix inches. It is entirely covered over with ſcales, and has a ſkin perfectly the ſame as that of a large fiſh.

The females are ſaid to go four months with young. They bring forth about the cloſe of winter, and their number generally conſiſts of two or three at a time. About this period the males leave them, and go forth into the fields, where they enjoy all the ſweets of the ſpring. In this ſeaſon they pay occaſional viſits to their habitation, but never reſide in it. There, however, the females remain employed in ſuckling, tending, and rearing up their young, who can follow them in a few weeks. They then, in their turn, go abroad, where they feed on fiſh, or on the bark of young trees, and ſpend their whole time in the water, or the woods.

Winter is the principal ſeaſon for hunting them, as it is then only that their fur is in perfection. After their fabrics are demoliſhed, and a great number happen to be taken, their ſociety is never reſtored. The few that have eſcaped captivity or death, become houſeleſs wanderers; or, concealed in ſome hole under ground, and reduced to the condition of other animals, they lead a timed life. They no longer employ themſelves but to ſatisfy their immediate and moſt urgent wants. They no longer retain thoſe faculties and qualities which they ſo eminently poſſeſs in a ſtate of ſociety.

We meet with beavers in America from the thirtieth degree of north latitude to the ſixtieth, and even beyond it. In the northern parts they are very common; and the farther ſouth we proceed, their number is ſtill found to decreaſe. The ſame obſervation holds with reſpect to the Old Continent. We never find them numerous but in the more northern countries; and in France, Spain, Italy, Greece, and Egypt, they are exceedingly rare. They were no ſtrangers to the ancients; and by the religion of the Magi it was forbidden to kill them.

Several authors have ſaid, that the beaver, being an aquatic animal, could not live ſolely on land. This opinion, however, is erroneous; for the beaver which I have in my poſſeſſion having been taken when quite young in Canada, and been always reared in the houſe, did not know the water when he was brought to it, was afraid of it, and refuſed to go into it. Even when firſt plunged into a baſon there was a neceſſity for keeping him in it by force. A few minutes after, however, he became ſo well reconciled to it, that he no longer diſcovered an averſion to his new ſituation; and, when afterwards left to his liberty, he frequently returned to it, and would even roll about in the dirt, and upon the wet pavement. One day he made his eſcape, and deſcended by a cellar ſtair caſe into the quarries under the Royal Garden. There he ſwam to a conſiderable diſtance on the ſtagnated waters which are at the bottom of thoſe quarries; yet no ſooner did he ſee the light of the torches which were ordered down for the purpoſe of finding him, than he returned, and allowed himſelf to be taken without the ſmalleſt reſiſtance.

He is familiar without being fawning; and when he ſees people at table, he is ſure to aſk ſomething to eat. This he does by a little plaintive cry, and by a few geſtures of his fore paws. When he has obtained a morſel, he carries it away, and conceals himſelf, in order to eat it at his eaſe. When he ſleeps, which he does very often, he lies upon his belly. No food comes amiſs to him, meat excepted; and this he conſtantly refuſes either raw or boiled. He gnaws every thing he comes near; and it was found neceſſary to line with tin the tun in which he was brought over.

Beſides the fur, which is indeed the moſt valuable article furniſhed by the beaver, this animal furniſhes a ſubſtance that has been conſiderably uſed in medicine. This ſubſtance, which is known by the name of *caſtoreum*, is contained in two bladders[*]. The ſavages are ſaid to obtain an oil from the tail of the beaver, which they employ as a topical remedy for different complaints. The fleſh of this animal, though fat and delicate, is yet bitter, and diſagreeable to the palate.

The ſenſes of the beaver are very acute; and ſo delicate is its ſmell, that it will ſuffer no filth to remain near it. When kept too long in confinement, and under a neceſſity of voiding its excrements, it drops them near the threſhold of its priſon, and, when the door is opened, it is ſure to puſh them out.

The Racoon.

The Raccon is an animal of about the ſame ſize as a ſmall badger. Its body is ſhort and bulky. Its fur is fine, long, thick, blackiſh at the ſurface, and grey towards the bottom. Its head is like that of the fox, but its ears are round and ſhorter. Its eyes are large, of a yellowiſh green, and over them there is a black and tranſverſe ſtripe. Its ſnout is ſharp. Its tail is thick, but tapering towards a point, and marked alternately from one end to the other with black and white rings, and is at leaſt as long as the body. Its fore legs are much ſhorter than the hind ones, and both are armed with five ſtrong, ſharp claws.

This animal uſes its paws to hold its food while eating; and its pointed claws enable it to climb trees with great dexterity. It runs up the trunk with the ſame ſwiftneſs that it moves over the plain, and frolics about to the extremity of the branches with great ſecurity and eaſe; on the ground, indeed, it rather bounds than runs, and its motions, though oblique, are yet always quick and expeditious.

The racoon is a native of the ſouthern countries of America and the Weſt-Indies, nor has it ever yet been found in any part of the Old Continent.

The Coati.

The animal of which we are now about to treat, many authors have called *coati-mondi*. It is very different from the animal deſcribed in the preceding article. It is of a ſmaller ſize than the racoon. Its body and neck, its head and noſe are of a more lengthened form. Its upper jaw is an inch, or an inch and a half longer than the lower one; and its ſnout, which is moveable in every diviſion, turns up at the point. The eyes of the coati are alſo ſmaller than the eyes of the racoon. Its hair is longer and coarſer, its legs are ſhorter, and its feet longer; but, like the racoon, its tail is deverſified with rings; and to all its feet there are five claws.

This animal has a practice of eating its own tail, which, when not mutilated, is longer than its body, and which it generally raiſes aloft, and can move with eaſe in any direction.

From this circumſtance we may infer that in thoſe parts of which the extremities are conſequently very remote from the ſeat of the ſenſes, that feeling muſt be weak, and the more ſo, the greater the diſtance, and the ſmaller the part.

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[*] It is pretended, that the beavers extract the liquid which is contained in theſe bladders by preſſing them with the foot; and that it gives them an appetite when they are averſe to food. The truth, however, ſeems to be, that the animal uſes this liquid, in order to greaſe its tail.

As for the coati in other reſpects, it is an animal of prey, which ſubſiſts on fleſh and blood, which, like the fox, deſtroys ſmall animals and poultry, hunts for the neſts of little birds, and devours their eggs; and it is probably from this conformity of diſpoſition, that ſome authors have conſidered the coati as a ſpecies of ſmall fox.

The Agouti.

This animal is about the ſize of a hare, and has been improperly conſidered as a kind of rabbit, or large rat, by the greater number of of nomenclators. It has both the hair of an hog, and the voracious appetite of that animal. It eats every thing indiſcriminately; and when ſatiated, it hides the remainder, like the dog or the fox, for a future occaſion.

It does not, like the rabbit, dig a hole in the ground, but burrows in the holes of trees. Its ordinary food conſiſts of the roots of the country, potatoes, yams, and ſuch fruits as fall from the trees in autumn. It uſes its fore-paws like the ſquirrel, to carry its food to its mouth; and as its hind feet are longer than the fore-ones, it runs very ſwiftly upon level ground, or up a hill, but upon a declivity it is in danger of falling. Its ſight is excellent; its hearing is equal to that of any other animal; and whenever it is whiſtled to, it ſtops to liſten. The fleſh is dreſſed like that of a ſucking pig, and of ſuch as are well fed, it is tolerable food, though it has always a peculiar taſte, and is rather tough.

It is hunted by dogs; and whenever it goes into a ſugar ground, where the canes cover the place, it is eaſily catched. When in the open country, it uſually runs with great ſwiftneſs before the dogs until it gains its retreat, within which it continues to hide, and nothing but filling the hole with ſmoke can force it out. For this purpoſe the huntſman burns faggots or ſtraw at the entrance, and conducts the ſmoke in ſuch a manner that it fills the whole cavity. While this is doing, the poor little animal ſeems ſenſible of its danger, begs for quarter with a moſt plaintive cry, but ſeldom quits its hole till the utmoſt extremity.

The agouti ſeems to be a native of the ſouth parts of America; nor is it at all known in the Old Continent. It is, however, very common in Braſil, Guiana, St Domingo, and all the neighbouring iſlands. To the cold and temperate climates of America this animal is an entire ſtranger.

CHAP. XIV.

OF CARNIVOROUS ANIMALS CONTINUED—THE LION—THE TIGER—THE PANTHER, OUNCE, AND LEOPARD—THE JAGUAR—THE COUGUAR—THE LYNX—THE CARACAL—THE HYÆNA—THE CIVET AND ZIBET—THE GENETT—THE ONDATRA AND DESMAN.

The Lion.

IT has been remarked that in all hot climates, the terreſtrial animals are larger and ſtronger than in cold or temperate ones. They are alſo bolder and more ferocious, all their natural qualities ſeeming to partake of the ardour of the climates in which they live. The lion, produced beneath the burning ſun of Africa, or of India, is above all others the fierceſt and moſt terrible. Our wolves, our other carnivorous animals, far from being his rivals, are hardly worthy to be his providers. The lions of America (if, indeed, they deſerve to be called lions) are, like the climate in which they are produced, infinitely milder than thoſe of Africa; and, what clearly proves that the degree of fierceneſs in this animal depends on the degree of heat, is, that, even in the ſame country, thoſe which inhabit the high mountains, where the air is more temperate, are different in diſpoſition from thoſe that dwell in the plains, where the heat is exceſſive.

As the lion has no enemy but man, and his ſpecies is now probably reduced to the fiftieth part of what it formerly was, it follows, that the human race, inſtead of having ſuffered a conſiderable diminution ſince the time of the Romans, is, on the contrary, more numerous, and more generally diffuſed. This ſuperiority in the numbers, and the arts of the human ſpecies, while it ſuffices to conquer the lion, ſerves alſo to enervate, and to diſcourage him; for he is brave only in proportion to the ſucceſs of his former encounters. Accuſtomed to meaſure his ſtrength with every animal he meets, the habit of conquering renders him intrepid and terrible. Having never experienced the dangerous arts and combinations of man, theſe animals have no apprehenſions from his power. They meet him with courage, and ſeem to brave the force of his arms. They are not daunted even with the oppoſition of numbers. A ſingle lion of the deſert, often attacks an entire caravan; and, after an obſtinate combat, when he finds himſelf overpowered, inſtead of flying, he continues to combat, retreating, but ſtill facing his enemy till he dies. On the contrary, the lions which inhabit the peopled countries of Morocco, or India, having experienced the ſuperiority of man, loſt all their courage, ſo as to be ſcared away with a ſhout; and ſeldom attack any but the unreſiſting flocks or herds, which even women and children are ſufficient to protect.

The external form of the lion ſeems to ſpeak the ſuperiority of his internal qualities. His figure is ſtriking, his look confident and bold, his gait proud, and his voice terrible. His ſtature is not over grown, like that of the elephant, or the rhinoceros; nor is his ſhape clumſey, like that of the hippopotamos, or the ox. He is in every reſpect compact and well-proportioned, a perfect model of ſtrength joined with agility.

His force and muſcular power, he manifeſts by his prodigious leaps and bounds; by the ſtrong and quick agitation of his tail, which alone is ſufficient to throw a man on the ground. By the facility with which he moves the ſkin of his face, and particularly that of his forehead, which adds greatly to his phyſiognomy, or rather to the expreſſive fury of his countenance; and in ſhort, by ſhaking his mane, which is not only briſtled up, but moved and agitated on all ſides when he is enraged.

The largeſt lions are about eight or nine feet long, from the ſnoot to the root of the tail, which is of itſelf four feet long; and theſe large lions are about four or five feet high. Thoſe of the ſmall ſize, are about five feet and a half long, and three and a half high. In all her dimenſions, the lioneſs is about a fourth leſs than the lion.

The lion is furniſhed with a mane, which becomes longer in proportion as he grows older. The lioneſs, howver, is without this appendage at every age. The American animal, which the natives of Peru call *puma*, and to which the Europeans have given the denomination of *lion*, has no mane. It is alſo much ſmaller, weaker, and more cowardly, than the real lion. In truth, it is very doubtful whether theſe animals are of the ſame ſpecies.

Both the ancients and the moderns allow that the lion when newly produced, is not above ſix or ſeven inches long; and if ſo, ſome years at leaſt muſt elapſe before he can increaſe to eight or nine feet. They likewiſe mention, that he is not in a condition to walk till two months after he is brought forth; but, without giving entire credit to theſe aſſertions, we may fairly conclude, that the lion, from the largeneſs of his ſize, is at leaſt three or four years in growing, and that, conſequetnly, he muſt live ſeven times three or four years, that is, about twenty-five years.

It is uſually ſuppoſed that the lion does not poſſeſs the ſenſe of ſmelling in ſuch perfection as moſt other animals of prey. Too ſtrong a light incommodes him. He ſeldom goes abroad in the middle of the day. He commits all his ravages in the night. When he ſees a fire kindled near a herd or flock he will not venture near it. Though his ſight is bad, it is not, however, ſo faulty as his ſmell; and unlike the dog and the wolf, he rather hunts by the former than by the latter.

The lion, when hungry, boldly attacks all animals that come in his way; but, as he is very formidable, and as they all ſeek to avoid him, he is often obliged to ſkulk that he may take them by ſurpriſe. For this purpoſe he crouches upon his belly, in ſome thicket, or among the long graſs, which is found in many parts of the foreſt. In this retreat he continues, with patient expectation, until his prey comes within a proper diſtance; and he then ſprings after it with ſuch force, that he often ſeizes it at the firſt bound. If he miſſes the effort, and in two or three re-iterated ſprings cannot ſeize his prey, he continues motionleſs for a time, ſeems to be very ſenſible of his diſappointment, and waits for a more favourable opportunity. He devours a great deal at a time, and generally fills himſelf for two or three days to come. His teeth are ſo ſtrong that he very eaſily breaks the bones, and ſwallows them with the reſt of the body. It is reported that he can endure hunger a very long time; but he cannot ſupport thirſt in an equal degree, his temperament being extremely hot. He drinks as often as he meets with water, lapping like a dog. He generally requires about fifteen pounds of raw fleſh in a day; and ſeldom devours the bodies of animals when they begin to putrify. While young and active, the lion ſubſiſts on what he can obtain by the chace, and ſeldom quits his native deſerts and foreſts; but when he becomes old, heavy, and leſs qualified for exerciſe, he approaches the habitations of man, to whom he becomes a dangerous enemy. It is obſerved, however, that when he ſees men and animals together, it is always on the latter, never on the former, that he vents his fury; unleſs indeed he ſhould be ſtruck, and then, at no loſs to know whence the blow came, he inſtantly deſerts his prey, in order to be revenged for the injury. The fleſh of the camel he is ſaid to prefer to that of any other animal. He is likewiſe exceedingly fond of that of young elephants, which, from their inability to reſiſt him till they have received the aſſiſtance of their tuſks, he eaſily diſpatches, when unprotected by the dam; nor are there any animals able to oppoſe the lion, but the elephant, the rhinoceros, the tiger, and the hippopotamos.

However terrible this animal may be, it is not uncommon, with dogs of a large ſize, and well ſupported with a proper number of men on horſeback, to chace him, diſlodge him, and force him to retire. But for this enterprize it is neceſſary that the dogs, and even the horſes, ſhould be previouſly diſciplined; ſince almoſt all animals tremble and fly at the very ſmell of the lion. Though his ſkin is firm and compact, it is not, however, proof againſt a muſket-ball, or even a javelin. Like the wolf, he is frequently taken by ſtratagem; and for this purpoſe a deep hole is dug in the earth, over which, when ſlightly covered with earth and ſticks, ſome living animal is faſtened, as a bait. When thus entrapped, all his fury ſubſides; and if advantage be taken of the firſt moments of his ſurpriſe, he may be eaſily chained, muzzled, and carried off.

The fleſh of the lion is of a ſtrong and diſagreeable flavour; yet the Negroes and the Indians do not diſlike it, and it frequently forms a part of their food.

The Tiger.

In the claſs of carnivorous animals the lion is the foremoſt. Next to him is the tiger, which, while he poſſeſſes all the bad qualities of the former, ſeems to be a ſtranger to his good ones. To pride, to courage, to ſtrength, the lion adds greatneſs, and ſometimes, perhaps, clemency; while the tiger, without provocation is fierce, without neceſſity is cruel. Thus it is throughout all the claſſes of Nature, in which the ſuperiority of rank proceeds from that of ſtrength. The firſt claſs is leſs tyrrannical than the inferior claſſes, which, denied ſo full an exertion of authority, abuſe the powers with which they are entruſted.

The tiger is therefore more to be dreaded than the lion. He is the ſcourge of every country which he inhabits. Of the appearance of man, and of all his hoſtile weapons, he is fearleſs. Wild animals as well as tame ones fall a ſacrifice before him. He attacks the young elephant and rhinoceros; and ſometimes, with an audacity ſuperior to his nature, he braves the lion himſelf.

The form of the body uſually correſponds with the nature, and the diſpoſition of the animal. The tiger, with a body too long, with limbs too ſhort, with a head uncovered, and with eyes ghaſtly and haggard, has no characteriſtics but thoſe of the baſeſt and moſt inſatiable cruelty. Inſtead of inſtinct he has nothing but an uniform rage, a blind fury;

ſo blind indeed, ſo undiſtinguiſhing, that he frequently devours his own progeny, and, if ſhe offers to defend them, he tears in pieces the dam herſelf.

Happy is it for the reſt of nature, that this animal is but rare, and that the ſpecies is chiefly confined to the warmeſt provinces of the Eaſt. The tiger is found in Malabar, in Siam, in Bengal, and in all the countries which are inhabited by the elephant or the rhinoceros.

When he has killed a large animal, ſuch as a horſe, or a buffalo, he does not devour it on the ſpot, but in order to feaſt at his eaſe, he draggs it along with ſuch eaſe to the foreſt, that the ſwiftneſs of his motion ſeems ſcarcely retarded by the enormous weight.

To give a ſtill more complete idea of the ſtrength of this terrible creature, we ſhall quote a paſſage from Father Tachard, who was an eye-witneſs of a combat of one tiger againſt three elephants at Siam. For this purpoſe, the king ordered a lofty palliſade to be built of bamboo cane, about an hundred feet ſquare; and in the midſt of this were three elephants to combat the tiger. Their heads and part of their trunks were covered with a kind of armour, like a maſk, which defended that part from the aſſaults of the fierce animal with which they were to engage. As ſoon, ſays this author, as we were arrived at the place, the largeſt tiger we had ever ſeen was brought from his den. He was not at firſt let looſe, but held with cords, ſo that one of the elephants approaching, gave him three or four blows, with his trunk, on the back, with ſuch force, that the tiger was for ſome time ſtunned, and lay without motion, as if he had been dead. However, as ſoon as he was let looſe, and at full liberty, although the firſt blows had greatly abated his fury, he made at the elephant with a loud ſhriek, and aimed at ſeizing his trunk. But the elephant, wrinkling it up with great dexterity, received the tiger on his great teeth, and toſſed him up into the air. This ſo diſcouraged the furious animal, that he no more ventured to approach the elephant, but made ſeveral circuits round the palliſade, often attempting to fly at the ſpectators. Shortly after, a ſecond and then a third elephant were ſent againſt him, which ſtruck him ſo terribly with their trunks, that he once more appeared dead; and they would certainly have diſpatched him, had not a ſtop been put to the combat.

The tiger, of which Father Gouie has communicated to the Academy of Sciences an anatomical deſcription, compoſed by the Jeſuit-Fathers at China, ſeems to belong to the true ſpecies, as alſo that which the Portugueſe have diſtinguiſhed by the name of *Royal Tiger*. According to Delion there is no country of India in which tigers ſo much abound as Malabar, where the ſpecies are numerous, but the largeſt is that which the Portugueſe call the *Royal Tiger*, which is very rare, and is as large as a horſe.

The ſpecies of the tiger has always been much rarer, and much leſs generally diffuſed, than that of the lion. Like the lioneſs, nevertheleſs, the tigreſs produces four or five at a birth. From her nature ſhe is fierce at all times; but when ſurrounded with her infant progeny, and in the ſmalleſt danger of loſing them, her fury, becomes extravagant. To oppoſe the daring invaders of her den, ſhe braves every danger. On ſuch occaſions, ſhe purſues the ſpoiler with the moſt inveterate enmity; who is frequently obliged to drop one of her cubs. With this ſhe immediately returns to her den, and again purſues him:

he then drops another; and, by the time ſhe has returned with that, he for the moſt part eſcapes with the remainder. Should her young be torn from her entirely, ſhe expreſſes her agony with hideous cries, and follows the ſporter to the very town, or ſhip, in which he may have taken refuge, and dares him, to approach her.

The ſkins of theſe animals are much eſteemed in the eaſt, particularly in China. The Mandarines cover their ſeats of juſtice with them, and convert them into coverings for cuſhions in winter. The Indians eat the fleſh of the tiger, and find it neither diſagreeable nor unwholeſome.

The Panther, Ounce, and Leopard.

The firſt of theſe ſpecies which exiſts in the Old Continent is the *large panther*, which we ſhall ſimply call *panther*, and which the Greeks diſtinguiſhed by the name of *pardalis*, the ancient Latins, firſt by the name of *panthera*, afterwards by that of *pradus*, and the modern Latins by the name of *leopardus*. The body of this animal, when it has attained its full growth, is five or ſix feet long from the tip of the noſe to the inſertion of the tail, which is above two feet long. Its ſkin is of a yellow hue, more or leſs dark on the back and ſides, and whitiſh under the belly. It is marked with black ſpots in the form of beads. Of theſe rings the greateſt number have one or more ſpots in the center, of the ſame colour with the extremity of the ring. Some of them are oval, and others circular; and they are frequently above three inches in diameter.

The ſecond ſpecies is the *ſmall panther* of Oppian, which our modern travellers have called *ounce*, or *onza*, corruptedly from the name *lynx*, or *lunx*. To this animal we ſhall preſerve the name of *ounce*, which, as it has in fact ſome affinity to the lynx, ſeems to be properly applied. It is much ſmaller than the panther; its body, which is nearly of the ſize of the lynx, being but about three feet and a half long. Its hair, as alſo its tail, are longer than thoſe of the panther. The latter frequently meaſures above three feet; though the body of this animal is at leaſt a third leſs than that of the panther, whoſe tail does not meaſure more than two feet, or two and a half at moſt. The hair of the ounce is of a whitiſh grey upon the back and ſides, and of a grey ſtill whiter under the belly; whereas the back and ſides of the panther are always of a yellow more or leſs deep. In both, however, the ſpots are nearly of the ſame form, and of the ſame ſize.

The third ſpecies is not mentioned by the ancients, as it belongs to Senegal, to Guinea, and to other ſouthern countries which they had not diſcovered. This animal we ſhall call *leopard;* a name which has been improperly applied to the large panther, but which, following the example of moſt travellers, we ſhall never uſe unleſs to denote the above-mentioned animal of Senegal. It is ſomewhat larger than the ounce, but conſiderably ſmaller than the panther, being only four feet long. The tail meaſures two feet or two feet and a half. On the back and ſides the hair is of a yellow colour more or leſs deep; under the belly it is whitiſh; the ſpots are annular, but ſmaller, and leſs regularly diſpoſed.

As each of theſe animals is different from the other, ſo each forms a diſtinct ſpecies. Our furriers call the ſkins of the firſt ſpecies *pantherſkins;* a name which, we ſhall not change. Thoſe of the ſecond ſpecies they call *African tiger-ſkins*, which, being an equivocal name, we have ſet aſide, and adopted that of *ounce*. In ſhort, they improperly call *tiger-ſkins*, the ſkins of the animal which we have here denominated the leopard.

The ſpecies of the ounce ſeems to be more numerous, as well as more generally diffuſed than that of the panther. In Barbary, in Arabia, and in all the ſouthern parts of Aſia, Egypt perhaps excepted, it is very common. It is known even in China, where it is diſtinguiſhed by the name of *hinen-pao*.

The ounce is eaſily tamed, and is employed for the chace, in the hot climates of Aſia, where the dog is not to be found, unleſs introduced from other parts; and then it not only loſes its voice, but its inſtinct. Beſides, the panther, the ounce, and the leopard, are alike remarkable for bearing an antipathy to dogs, which they ſeize in preference to every other animal.

The Jaguar.

The jaguar reſembles the ounce both in diſpoſition and in ſize, and for the moſt part in the form of the ſpots with which his ſkin is diverſified. He is leſs terrible, leſs ferocious, than the panther and the leopard. The ground of his colour, like that of the latter, is a bright yellow, and not grey like that of the ounce. His tail is ſhorter than that of either of thoſe animals. His hair is longer than the panther's, but ſhorter than that of the ounce. It is frizzled while he is young, but ſmooth and ſtrait when he is full grown.

The jaguar lives by prey like the tiger; but a lighted brand will put him to flight, will deprive him of all courage, and vivacity. He ſeems to partake of the indolence ariſing from the nature of the climate; nor does he diſcover any activity or alertneſs, unleſs when preſſed by hunger.

Almoſt all the authors who have written the Hiſtory of the New World, have mentioned this animal; ſome under the name of *tiger*, or *leopard*, others under the names which it bears at Braſil, Mexico, &c. They alſo ſpeak of another animal of the ſame genus, and perhaps indeed of the ſame ſpecies, under the name of *jaguaret*, which we have diſtinguiſhed from the jaguar in our enumeration. Whether they are two diſtinct ſpecies, however, or only varieties of the ſame ſpecies, I cannot poſitively affirm, having ſeen only one of the two kinds.

The jaguar is found in Braſil, in Paraguay, in Tucuman, in Guiana, in the country of the Amazons, in Mexico, and in all parts of South America. The jaguaret appears to have been always more rare, or at leaſt this creature has always inhabited ſuch places as are more diſtant from the haunts of men; and the few travellers who have mentioned it, have only drawn their accounts from thoſe of Marcgravius and Piſo.

The Couguar.

The Couguar is as long but not ſo thick as the jaguar. He has a ſmall head, a long tail, ſhort hair, which is of a lively red colour, intermixed with a few blackiſh tints, particularly on the upper part of the back. He is neither marked with long ſtripes, like the tiger, nor with round and full ſpots, like the leopard, nor with annular ſpots, like the panther and the ounce. His chin and his neck are whitiſh, and all the inferior parts of his body. Though leſs ſtrong than the jaguar, he is as fierce, and perhaps more cruel. He appears too to be more greedy of prey; nor, when once ſeized, does he ever offer to relinquiſh it till he has fully glutted his voracious appetite.

This animal is not uncommon in Guiana. Formerly couguars were known to ſwim over in numbers to the iſland of Cayenne, to attack and devour the flocks, and were conſidered as a ſcourge to the colony. By degrees, however, the ſettlers leſſened their number, and at length expelled them entirely.

The couguar, by the agility of his body and the length of his legs, ſeems calculated to run, and to climb trees better than the jaguar. They are both equally remarkable for ſloth and cowardice when once they are ſatiated with prey; and ſeldom known to attack men, unleſs when they find them aſleep. They delight in the lofty ſhades of foreſts, where they hide themſelves in the covert of ſome thick tree, in order to dart forth on ſuch animals as paſs by. Though they live only upon prey, and quench their thirſt more often with blood than with water, yet it has been ſaid by ſome, that their fleſh is exceedingly palatable. Piſo ſays expreſsly, that it is as good as veal; and Charlevoix and others have compared it to mutton. It is hardly credible, however, from the above circumſtances, that it can be well taſted; and therefore I prefer the teſtimony of Deſmarchais, who ſays, that the beſt thing about this animal is his ſkin, with which they make houſings for horſes, and that its fleſh is of no value, being generally lean and of a diſagreeable flavour.

The Lynx.

The Lynx is an animal more commonly found in cold than in temperate climates; and is at leaſt very rare in hot ones. It was known to the Greeks and the Latins. Pliny ſays, that the firſt which were ſeen in Rome were brought, in the time of Pompey, from Gaul. At preſent they are not ſeen in France, a few perhaps excepted, belonging to the Alpine and Pyrenæan mountains. But the Romans, under the name of Gaul, comprehended ſeveral northern countries; and, beſides, modern France is far from being ſo cold as ancient Gaul was formerly.

The moſt beautiful ſkins of the lynx are brought from Siberia, as belonging to the *lupus cervarius*, and from Canada, as belonging to the *felis-cervarius*. Becauſe they are like all other animals of the New Continent, ſmaller than thoſe of the Old World. In Europe they are compared to a wolf in ſize, and in Canada to a wild cat.

The lynx, of which the ancients have ſaid, that the ſight was ſo ſharp as to penetrate opaque bodies, and of which the urine was made to poſſeſs the marvellous property of hardening into a ſolid ſubſtance a precious ſtone, called *lapis lyncurius*, is an animal which never exiſted. To the true lynx this imaginary one has no affinity, but in name. We muſt not, therefore, as the moſt of naturaliſts have hitherto done, attribute to the former, which is a real being, the properties of this imaginary one, the exiſtence of which, Pliny himſelf does not ſeem diſpoſed to believe, and which he claſſes with the ſphynx, the pegaſus, and other prodigies, or monſters, the produce of Æthiopia.

Our lynx poſſeſſes not the wonderful quality of ſeeing through walls; but it has bright eyes, a mild aſpect, and, upon the whole, an agreeable and lively appearance. Its urine produces not precious ſtones, but, like the cat, an animal which it nearly reſembles, and of which it retains the manners, and even the cleanlineſs, it covers it over with earth.

The lynx has ſhort legs, and is generally about the ſize of the fox. It differs from the panther and the ounce in the following particulars. It has long hair, its marks or ſpots are of a colour leſs lively, and are badly diſpoſed. Its ears are ſurrounded at the extremity by a ſtripe, or rather tuſt, of black hair: its tail, which is much ſhorter, is black at the tip: its eyes have a whitiſh caſt; and its countenance has ſomething in it more mild. The ſkin of the male is more beautifully marked than that of the female. It does not walk or run like the wolf in a progreſſive motion, but leaps and bounds like the cat. It gains its ſole ſubſiſtence by devouring other animals, which it will purſue to the very tops of trees. Neither can the wild cat, the martin, the ermine, nor the ſquirrel, eſcape its purſuit. It alſo ſeizes birds, lies in wait for the ſtag, the roebuck, and the hare, and often with one bound ſeizes them by the throat. When in poſſeſſion of its prey, it firſt ſucks the blood of the animal, and then lays open the head, in order to devour the brains. It then generally abandons the victim of its fury, goes in queſt of freſh prey, and is ſeldom known to return to the former; a circumſtance which has given riſe to the vulgar remark, that of all animals the lynx has the ſhorteſt memory. The ſkin of this animal changes its colour according to the ſeaſon and climate. In winter it is in every reſpect better than it is in ſummer; and its fleſh like that of all beaſts of prey, is improper food.

The Caracal, or Syaguſh.

Though the caracal reſembles the lynx in ſize, in the formation of the body, and the aſpect of the head; and, though like that animal, it ſeems to have the peculiar, and almoſt ſingular characteriſtic of a ſtripe of black hair at the extremity of the ears, I am inclined to treat of them as animals of different ſpecies.

The caracal is not ſpotted like the lynx; it has hair rougher and ſhorter, its tail is larger, and of an uniform colour; its ſnout is longer; in appearance it is leſs mild, and in diſpoſition it is fiercer. The lynx is an inhabitant of the cold, or at moſt of the temperate regions. The caracal, on the other hand, is only found in the hot countries; and it is as much from their difference in diſpoſition and climate that I have judged them to be of two different ſpecies, as from the inſpection and compariſon of the animals themſelves.

The caracal is common in Barbary, in Arabia, and in all thoſe countries which are inhabited by the lion, the panther, and the ounce. Like them it depends on prey for its ſubſiſtence; but, unlike them, from its inferior ſize, and its inferior ſtrength, it has much difficulty in procuring its prey. Hardly, indeed, has it any thing to ſubſiſt on but what the more potent carnivorous animals are diſpoſed to leave for it. It keeps at a diſtance from the panther, becauſe that animal exerciſes its cruelty even after he is ſatisfied with food; but it follows the lion, who, when the immediate cravings of his appetite are gratified, is of a pacific diſpoſition. From the refuſe of what this noble animal has devoured, the caracal frequently enjoys a comfortable meal. Sometimes, even while the lion is in ſearch of prey, by climbing trees, it braves his fury; for he cannot aſcend after it like the panther. For all theſe reaſons it is, that the caracal has been called the "lion's guide," the "lion's provider;" and that the lion, whoſe ſmell is far from being acute, is ſaid to employ this animal to find out prey for him by its ſcent, of which, for its trouble, it enjoys the remains, when its maſter is ſatisfied.

The caracal is about the ſize of a fox, but much fiercer, and ſtronger. It has been known to attack, tear in pieces, and deſtroy in a few minutes, a large dog that exerted himſelf to the utmoſt. It is very difficult to tame this animal; yet, if taken when very young, and afterwards reared with care, it may be trained to the chace, to which it is by nature inclined, and in which it is ſure to ſucceed, provided it is not let looſe but againſt ſuch animals as are unable to reſiſt it. In India they make uſe of this animal to take hares, rabbits, and even large birds, all of which it ſeizes with ſingular addreſs.

The Hyæna.

So ſtriking, and even ſo ſingular are the characteriſtics of the hyæna, that it is hardly poſſible to be deceived by them. It is, perhaps, the only quadruped which has but four toes to either the fore or hind feet. Like the badger it has an aperture under the tail, which does not penetrate into the interior parts of the body. Its ears are long, ſtrait, and bare: its head is more ſquare and ſhorter than that of the wolf: its legs, the hind ones eſpecially, are longer: its eyes are placed like thoſe of the dog: the hair of its body, and its mane, are of a dark grey, with a ſmall intermixture of yellow and black, diſpoſed all along in waves; and though its ſize is equal to that of the wolf, yet it has a contracted appearance.

This ſolitary creature reſides in the caverns of mountains, in the clefts of rocks, or in dens, which it has formed for itſelf under the earth. Though taken very young, it is very incapable of being tamed. It lives by depredation, like the wolf; but it is a ſtronger animal, and ſeemingly more daring. It ſometimes attacks men, carries off cattle, follows the flocks, breaks open the ſheep-cotes by night, and ravages with an inſatiable voracity. Its eyes are keen and piercing and it is ſaid to ſee beſt at night. If we may credit all the naturaliſts who have treated of this animal, its cry reſembles the ſobs or reachings of a man in a violent fit of vomiting; but, according to Kœmpfer, who was an ear-witneſs of it, it ſounds like the lowing of a calf.

The hyæna defends itſelf againſt the lion, is not afraid of the panther, and attacks the ounce, which is incapable of reſiſting it. When at a loſs for other prey, it ſcrapes up the earth with its feet, and devours the carcaſes both of animals and men, which, in the countries that it inhabits, are interred promiſcuouſly in the fields. We find this creature in almoſt all the hot climates of Africa, and of Aſia; and it ſeems probable that the animal called *faraſſe*, at Madagaſcar, which reſembles the wolf in figure, but which is larger, ſtronger, and more cruel, may be the *hyæna.*

Of few animals, have ſo many abſurd ſtories been told as of this. The ancients repreſent it as being male and female alternately. It appears, however, that the circumſtance which gave riſe to this fable, is, the opening in the form of a cleft, which both the male and the female have, independently of the parts deſtined for the purpoſes of generation. It has been affirmed too, that this creature could imitate the human voice, that it remembered the names of the ſhepherds, called to them, charmed,

charmed them, rendered them motionleſs; that, at the ſame time, it gave chace to the ſhepherdeſſes, made them forget their flocks, and be diſtracted with love, &c. All theſe things might ſurely happen without the intervention of an hyæna; and I conclude this article, in order to avoid the reproach which is due to Pliny, of ſeeming to take a pleaſure in compiling and publiſhing fables.

The Civet and the Zibet.

It has been the opinion of moſt naturaliſts, that there is only one ſpecies of animals that furniſhes the perfume known by the name of *civet.* I, however, have ſeen two that furniſh it, and which, though reſembling each other in the eſſential affinities of conformation, do yet differ from each other in ſo many other characteriſtics, that there is ſufficient reaſon to conſider them as forming different ſpecies.

To the firſt of theſe animals I have appropriated its original name of *civet;* and to the ſecond I have given that of *zibet.*

This latter animal differs from the civet, in having a body longer and ſmaller, a ſnout more ſlender, flatter, and ſomewhat concave at the upper part. Its hair is much ſhorter and ſofter. It has no mane, no black under the eyes, or upon the cheeks. All theſe characteriſtics are peculiar to the civit. Some travellers had already ſuſpected that there were two ſpecies of civets; but no perſon had diſtinguiſhed them with ſufficient accuracy to deſcribe them.

Theſe animals have been called *muſk-cats*, or civet-cats; yet they have nothing in common with the cat. They rather reſemble the fox, eſpecially in the head. Their coat is diverſified with ſtripes and ſpots; a circumſtance which has occaſioned them to be miſtaken for ſmall panthers, by perſons who had only ſeen them at a diſtance. In every other reſpect, however, they differ from the panther. The perfume of the civet is very ſtrong, and that of the zibet is ſtrong to an exceſs.

This humour is found in the opening which each of theſe animals has near the parts of generation; and though the odour is ſo ſtrong, it is yet agreeable, even when it iſſues from the body of the animal. The perfume of the civet we muſt not confound with muſk, which is a ſanguineous humour obtained from an animal altogether different from either the civet, or the zibet. The animal that furniſhes the muſk is a kind of roe buck without antlers, or goat without horns; nor does it poſſeſs any property in common with the civet but that of furniſhing a ſtrong perfume.

The civets, though natives of the hotteſt climates of Africa, and of Aſia, are yet capable of living in temperate, and even in cold countries, if they are carefully defended from the injuries of the air, and provided with delicate and ſucculent food. In Holland, where no ſmall emolument is derived from their perfume, they are frequently reared. The perfume of Amſterdam is eſteemed preferable to that which is brought from the Levant, or the Indies, which is generally leſs genuine. That which is imported from Guinea would be the beſt of any, were it not that the Negroes, as well as the Indians and the people of the Levant, adulterate it with mixtures of laudanum, ſtorax, and other odorous drugs.

Thoſe who breed theſe animals for the ſake of their perfume, put them in a long and narrow box, in which they cannot turn. This box the perſon who is employed to collect the perfume opens behind, for this purpoſe, twice or thrice a week; and, dragging the animal which is confined in it backward by the tail, he keeps it in this poſition by a bar before. This done, he takes out the civet with a ſmall ſpoon. The perfume thus obtained, is put into a veſſel; and great care is taken to keep it cloſely ſhut.

The quantity which a ſingle animal will afford, depends greatly upon its appetite, and the quality of its nouriſhment. It furniſhes more, in proportion as it is more delicately and abundantly fed. Raw fleſh haſhed ſmall, eggs, rice, ſmall animals, birds, young fowls, and particularly fiſh, are the favourite food of the civit.

The civet is a wild, fierce animal, and, though ſometimes tamed, is yet never very familar. Its teeth are ſtrong and ſharp; but its claws are feeble and blunt. It is light and active, and lives by prey, purſuing birds, and other ſmall animals, which it is able to overcome. They are ſomtimes ſeen ſtealing into yards and outhouſes, like the fox, in order to carry off poultry. Their eyes ſhine in the night; and it is very probable that they ſee better by night than by day. When they fail of animal food, they are found to ſubſiſt upon roots and fruits. They very ſeldom drink; nor do they ever inhabit humid ground; but in burning ſands, and in arid mountains, they cheerfully remain.

The Genett.

The Genett is an animal ſmaller than the civet. It has a long body, ſhort legs, a ſharp ſnout, and a ſlender head. Its fur, which is exceedingly ſmooth and ſoft, is of an aſh-colour, gloſſy, and marked with black ſtripes, which are ſeparate upon the ſides, but which unite upon the back. It has alſo upon its neck a kind of mane, which forms a black ſtreak from the head to the tail, which laſt is as long as the body, and is marked with ſeven or eight rings, from the inſertion to the tip, which are alternately black and white.

The genett has under the tail, and in the very ſame place with the civet, an opening, in which is ſeparated a kind of perfume reſembling civet, but leſs ſtrong, and apter to evaporate. It is an animal ſomewhat larger than the martin, which it is very like, not only in the form of the body, but alſo in diſpoſition and habit, and from which it ſeems chiefly to differ in being more eaſily tamed.

The Ondatra, and the Deſman.

The Ondatra and the Deſman, are two animals which muſt not be confounded, though they have both been denominated *muſk-rats*, and though they have a few common characteriſtics.

The ondatra, or muſk-rat of Canada, differs from the deſman in having its toes all ſeparated from each other, in having eyes very conſpicuous, and a very ſhort ſnout. The deſman or muſk-rat of Muſcovy, on the other hand, has the toes of its hind feet united by a membrane. The tail of both is flat; and not only in this circumſtance, but in a number of eſſential characteriſtics, they differ from the pilori, or muſk-rat of the Antilles.

The ondatra is of the ſize of a ſmall rabbit, and of the form of a rat. Its head is ſhort, and ſimilar to that of the water-rat; its hair is ſoft and gloſſy, with a very thick down underneath, nearly like that of the beaver. Its tail is long, and, though of a different form, covered with little ſcales, in the ſame manner as thoſe of other rats. Its ears are very ſhort, but not bare, like thoſe of the domeſtic rat.

The ſtriking ſingularities which have been remarked in the ondatra, are, the force and great expanſion of the muſcles of the ſkin, the ſuppleneſs of the falſe ribs, which permits ſo conſiderable a contraction of the body, that the muſk-rat is known to obtain an eaſy entrance into holes too narrow for the admiſſion of animals much ſmaller than itſelf. The manner too in which the female voids her urine, is a very ſtriking characteriſtic; the urethra not terminating, as in other quadrupeds, but at a hairy eminence ſituated over the os pubis. The teſticles, alſo which, as in other rats, are ſituated on each ſide of the anus, become prodigiouſly large while the ardour for propagation laſts. Add to theſe that the veſſels which contain the muſk or perfume of this animal, under the form of a milky humour, and which adjoin to the parts of generation, undergo the ſame changes; that, during the rutting ſeaſon, they enlarge and ſwell to a very great degree; that they decay ſoon after, and are at length totally effaced. The change in the bags which contain the preſume is effected more quickly, as well as more completely, than that of the parts of generation. They are common to both ſexes, and contain a very copious milky ſubſtance, while the animals are hot.

From the ondatra being a native of the ſame country with the beaver, and from its figure, its colour and its hair, they have been often compared with each other.

In diſpoſition and inſtinct alſo, theſe animals bear a conſiderable reſemblance to each other. Like the beavers, the ondatras live in ſociety during the winter. They form little dwellings, about two feet and a half, and ſometimes more, in diameter; and in theſe there is often found an aſſociation of ſeveral families. To ſuch habitations they do not reſort in order to ſleep for five or ſix months, like the marmots; their only object is, to obtain from them a ſhelter from the inclemency of the weather. They are of a round form, and are covered with a kind of cieling about a foot thick. The materials of which they are compoſed are ruſhes and certain herbs interwoven, and conſolidated with ſome clay, which they previouſly prepare for that purpoſe with their feet.

Theſe animals breed once a year, and generally produce five or ſix at a time. So ſtrong are their fore teeth, and ſo excellently calculated for gnawing, that, when one of them is ſhut up in a box, it preſently makes a hole to eſcape through, if the wood were of the hardeſt kind.

Theſe animals are little inclined to ferocity, and, when taken young, are eaſily tamed. In the very early period of life they are alſo, which might not be expected, exceedingly handſome; for then the long, and almoſt bare tail, which renders their figure very diſagreeable afterwards, is very ſhort. They play with all the innocence and ſprightlineſs of young cats; they never bite, and might be eaſily reared, were it not for their obnoxious ſmell.

CHAP.

CHAP. XV.

OF THE PECCARY, OR MEXICAN HOG—OF THE TERNAT BAT—THE SPECTRE—THE FLYING SQUIRREL—THE GREY SQUIRREL—THE PALM SQUIRREL, AND THOSE OF BARBARY, &C.—THE ANT-EATERS—THE SHORT AND LONG-TAILED MANIS—THE ARMADILLO—THE SPOTTED CAVY—THE OPOSSUM—THE MARMOSE—THE CAYOPOLIN.

The Peccary, or Mexican Hog.

AMONG the animals of the New World, we meet with few ſpecies more numerous, or more remarkable, than that of the peccary, or Mexican hog. At the firſt glance, this animal reſembles our wild boar, or rather the hog of Siam, which, as we have already obſerved, is, like our domeſtic hog, a variety of the wild boar, or wild hog; and for this reaſon it has been called the boar or hog of America. The peccary, however, is of a diſtinct ſpecies, and refuſes to engender either with the wild boar or the hog. It differs, however, from the hog, in a number of characteriſtics, both external and internal. It is leſs corpulent, and its legs are ſhorter. In the ſtomach and inteſtines there is a difference of conformation. It has no tail, and its briſtles are much ſtronger than thoſe of the wild boar; and, laſtly, it has, upon that part of the back which borders upon the buttocks, an opening from which there is diſcharged in ichorious humour of a very diſagreeable ſmell. The peccary is the only animal which has an opening in this region of the body. In the civets, the badger, and the genett, the reſervoir for the perfume is ſituated beneath the parts of generation; and in the muſk-animals we find it under the belly.

The peccary may be rendered a domeſtic animal, like the hog, and has, pretty much the ſame habits and natural inclinations. It feeds upon the ſame aliments; and its fleſh, though more dry and lean than that of the hog, is not unpalatable.

Theſe animals are extremely numerous in all the parts of South America. They generally herd two or three hundred together, and unite, like hogs, in the defence of each other. They are particularly fierce when any attempt is made to rob them of their young. They ſurround the plunderer, attack him without fear, and frequently his life falls a victim to his raſhneſs.

In its native country, the peccary is more fond of the mountainous parts, than of the low and level grounds. It ſeems to delight neither in the marſhes, nor the mud, like our hogs. It keeps among the woods, where it ſubſiſts upon wild fruits, roots, and vegetables. It is alſo an enemy to the lizard, the toad, and all the ſerpent kinds with which the uncultivated foreſts of the New Continent abound. As ſoon as it perceives a ſerpent, or a viper, it at once ſeizes it with its fore hoofs and teeth, fleas it an inſtant, and devours its fleſh.

The peccary, like the hog, is very prolific. The young ones follow the dam, and do not ſeparate from her till they have attained maturity. If taken at firſt, they are very eaſily tamed, and ſoon loſe all their natural ferocity: they, however, never diſplay any remarkable ſigns of docility. They only continue to do no miſchief; and they may be permitted to run tame, without any dangerous conſequences. They ſeldom ſtray far from home; they return of themſelves to the ſty, and do not quarrel among each other, except when they happen to be fed in common. When enraged, they draw their breath with great force, and their briſtles point up ward, and do not reſemble the briſtles of the wild boar ſo much as the ſharp armour of the hedge-hog.

The Rouſſette, or Ternat Bat[*], *the Rougette*[†], *and the Vampyre, or Spectre*[‡].

The rouſſette, and the rougette, ſeem to form two diſtinct ſpecies, which, however, are ſo like each other, that they ought not, in my opinion, to be claſſed together. The latter differs from the former ſolely in the ſize of the body, and the colours of the hair. The rouſſette, whoſe hair is of a reddiſh brown is nine inches long from the tip of the noſe to the inſertion of the tail, and three feet broad, when the membranes, which ſerve it for wings, are fully extended. The rougette, whoſe hair is of a reddiſh aſh-colour, is hardly more than five inches and a half long, and two feet broad; and its neck is half-encircled with a ſtripe of hair of a lively red, intermixed with orange-colour, of which we perceive no veſtige on the neck of the rouſſette. They both belong nearly to the ſame hot climates of the Old Continent. We meet with them in Madagaſcar, in the iſland of Bourbon, in Ternato, in the Philippine, and other iſlands of the Indian Archipelago, where, indeed, they ſeem to be more general than in the neighbouring continents.

In the hotter countries of the New World, we likewiſe meet with another flying quadruped, of which we know not the American name, but to which I will affix that of ſpectre, or vampyre, becauſe it ſucks the blood of men, and of animals, while they are aſleep, without awaking them. This American animal is of a ſpecies different from thoſe of the rouſſette and the rougette, which are both to be found ſolely in Africa, and in the ſouthern parts of Aſia.

The ſpectre is ſmaller than the rougette, which is itſelf ſmaller than the rouſſette. The former, when it flies, ſeems to be of the ſize of a pigeon; the ſecond of the ſize of a raven; and the third of the ſize of a large hen. Of both the rouſſette, and the rougette, the head is tolerably well ſhaped; the ears are ſhort, and nearly like that of a dog. Of the ſpectre, on the contrary, the noſe is longer; the aſpect is as hideous as that of the uglieſt bats; the head is unſhapely, and ſurmounted with large ears, very open, and very ſtraight; its noſe is disfigured. Its noſtrils reſemble a funnel, and have a membrane at the top, which riſes up in the form of a ſharp horn, or cock's comb, and adds greatly to the deformity of its face.

There is no doubt, therefore, but that the ſpecies of the ſpectre is different from thoſe of the rouſſette and the rougette. It is an animal not leſs miſchievous than it is deformed. It is the peſt of man, the torment and the deſtruction of animals. In confirmation of this truth, a more authentic teſtimony cannot be produced than that of M. de la Condamine. "The bats," ſays he, "which ſuck the blood of horſes, of mules, and even of men, when they do not guard againſt it by ſleeping under the ſhelter of a pavilion, are a ſcourge common to moſt of the hot countries of America. Of theſe are ſome of a monſtrous ſize. At

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[*] Vulgarly called the *flying dog*, and, by the generality of naturaliſts, the *great bat of Madagaſcar*.

[†] Vulgarly called the *red-necked flying dog*.

[‡] An American animal, which has hitherto been ſolely indicated under the vague names of *great American bat*, or *flying dog of New Spain*.

Borja, and ſeveral other places, they have entirely deſtroyed the large cattle which the miſſionaries had brought thither, and which had begun to multiply."

The rouſſette and rougette are larger, ſtronger, and perhaps even more miſchievous than the vampyre; but, it is by open force, and in the day as well as in the night, that they commit hoſtilities. Fowls and ſmall animals are the objects of their deſtructive fury. They attack men too, and bite their faces moſt cruelly; but no traveller has accuſed them of ſurprizing men and animals, while aſleep, and of taking ſuch opportunities to ſuck their blood.

All theſe bats are carnivorous, and moſt voracious animals. In a dearth of fleſh or fiſh, they feed on vegetables and fruits of every kind. As they are fond of the juice of the palm-tree, ſo it is eaſy to take them by placing in the neighbourhood of their retreat a few veſſels filled with palm-tree water, or any other fermented liquor. They faſten to, and ſuſpend themſelves from trees with their claws. They are uſually ſeen in troops, and oftener by night than by day. They ſhun places that are much frequented; and their favourite reſidence is in the deſerted parts of iſlands.

I have frequently thought it worth while to examine how it is poſſible that theſe animals ſhould ſuck the blood of a perſon aſleep, without cauſing, at the ſame time, a pain ſo ſenſible as to awake him. Were they to cut the fleſh with their teeth, or with their claws, the pain of the bite would effectually rouſe any of the human ſpecies, however ſoundly aſleep. It is only with their tongue therefore that it is poſſible for them to make ſuch minute apertures in the ſkin, as to imbibe the blood through them, and to open the veins without cauſing an acute pain.

I have not had an opportunity of obſerving the tongue of the vampyre; but that of ſeveral rouſſettes, which Mr Daubenton has attentively examined, ſeems to indicate the poſſibility of the fact. It is ſharp, and full of prickles directed backward; and it is probable, that theſe prickles, or points, from their exceeding minuteneſs, may be inſinuated into the pores of the ſkin, may enlarge them, and may penetrate them ſo deep, as to command a flow of the blood by the continued ſuction of the tongue. But theſe circumſtances are perhaps exaggerated, or erroneouſly related, by the writers who have tranſmitted them to us.

The Flying Squirrel.

The flying ſquirrel is of a particular ſpecies, and reſembles in few particulars either the ſquirrel or the rat. He is more common in America than in Europe, where he is ſeldom ſeen, except in Lithuania and Ruſſia. This little animal dwells upon trees, like the ſquirrel. He goes from branch to branch; and when he leaps upon another tree, his ſkin, which hangs looſe on both ſides of his body, is ſtretched forward by his fore legs, and backward by the hind legs, and increaſes the ſurface of his body, without adding to its weight, and conſequently retards the acceleration of his fall; ſo that this animal with one leap, bounds to a great diſtance. This motion is not like the flight of a bird, neither like the fluttering of a bat; both which motions are made by ſtriking the air with repeated vibrations. It is one ſingle leap, effected by the firſt impulſe, the motion of which is only prolonged, and longer, as the body of the animal, preſenting to the air the greater ſurface, finds a greater reſiſtance, and falls more ſlowly.

The flying ſquirrel is eaſily tamed; but he often flies; and he muſt be kept in a cage, or tied with a ſmall chain. He feeds upon bread, fruit, and ſeeds. He is remarkably fond of the buds and ſhoots of the birch and pine trees. He does not ſeek after nuts and almonds, like the ſquirrel. He makes a bed of leaves, in which he buries himſelf, and upon which he lies in the day time, and leaves it in the night, or when preſſed by hunger. As he has little agility, he becomes eaſily the prey of martins, and other animals, which climb up the trees; ſo that the ſpecies is not greatly multiplied, although they have commonly three or four young at a time.

The Grey Squirrel.

The grey ſquirrel is found in the northern parts of both continents, and is in ſhape like a common ſquirrel, but larger. The colour of his hair is not red, but light, or deep grey; and his ears are not ſo hairy towards the extremity, as thoſe of our ſquirrels. Many authors think the ſpecies is different in Europe and America; that the grey ſquirrels of Europe are of the common kind, and that they change their colour according to the ſeaſon, in the northern climates. Without denying this aſſertion, which does not however, ſeem ſufficiently proved, we conſider the grey ſquirrel of Europe and America as the ſame animal, and as a diſtinct ſpecies, ſeparated from that of common ſquirrels, who are found in the northern parts of both Continents, being of the ſame ſize and of the ſame colour; that is, of a red, more or leſs bright, according to the temperature of the country.

We have very little information with regard to the grey ſquirrel. Fernandez ſays, that the grey, or blackiſh ſquirrel of America dwells commonly upon trees, particularly pines; that he feeds upon fruits and ſeeds; that he lays up ſtore for the winter, in ſome hollow tree, whither he retires during that ſeaſon. The grey ſquirrel alſo differs from the others in making his neſt at the top of trees like birds.

The Palm-Squirrel, and thoſe of Barbary and Switzerland.

The palm-ſquirrel is as large as a rat, or a ſmall ſquirrel. He lives upon the palm-trees, from which he takes his name: Some call him the palmiſt rat, and others the palm-tree ſquirrel; and as he is neither of the ſpecies of a rat nor a ſquirrel, we ſhall call him palmiſt. His head is very near of the ſame form as that of the ſhort-tailed field mouſe, and covered with rough hair. His long tail does not lie on the ground like that of the rat. He carries it erect vertically, without however laying it on his body, as the ſquirrel, it is covered with hair longer than that of his body, but much ſhorter than the hair of the ſquirrel's tail. His back is variegated with white and brown ſtripes, which diſtinguiſh the palmiſt from all other animals, except the ſquirrels of Barbary and Switzerland.

With reſpect to the ſquirrel of Barbary, as he is of the ſame continent, and of the ſame climate, of the ſame ſize, and very near the ſame form as the palmiſt, one ſhould be inclined to think, that they are both of the ſame ſpecies, with ſome variety; yet there is ſtill reaſon to believe them to be different animals. We have ſeen all the varieties in the king's cabinet. The ſquirrel of Barbary has the head and forehead more crooked, the ears longer, the tail more buſhy than the palmiſt; he is more like a rat than a ſquirrel. The ſquirrel of Barbary has four white ſtripes, and the palmiſt has no more than three. The white ſtripe is on the palmiſt's back-bone; on the contrary, that of the ſquirrel of Barbary on the ſame part of his body is brown and red. Theſe animals, indeed, have very nearly the ſame habits, and are of the ſame nature as the common ſquirrel. They are both of a pretty figure. Their coat with white ſtripes is more valuable than that of the ſquirrel. Their ſhape is ſhorter, their body lighter, and their motions quicker. The palmiſt, and the ſquirrel of Barbary, dwell on trees like the common ſquirrel, but the Swiſs ſquirrel lives upon earth, and like the field-mouſe, forms a retreat that the water cannot penetrate. He is alſo leſs docile and leſs gentle than the two others. He bites without mercy, (except he is lately tamed,) and he is more like a rat, or a field-mouſe, than a ſquirrel, by inſtinct and nature.

The Tamanoir, the Tamandua, and the Fourmiller, or Ant-eater.

South America produces three ſpecies of animals, with a long ſnout, a ſmall mouth, and no teeth, with tongues of a round form, and remarkably long; with which they penetrate into the ants neſts, and draw out the ants, which is their principal food. The firſt of theſe ant-eaters is that which the Braſilians call tamandua guacu, or great tamandua, to whom the French that are in America have given the name of tamanoir. This animal is about four feet from the extremity of the ſnout to the origin of its tail; his head is fourteen or fifteen inches long, his ſnout ſtretches out to a great length; his tail, two feet and a half long, is covered with rough hair, which is above a foot long. His neck is ſhort, his head narrow, his eyes black and ſmall, his ears round, his tongue thin, more than two feet long, which he folds again in his mouth, after he draws it entirely out. His legs are but one foot high: the fore-legs are a little higher and more ſlender than thoſe behind: he has round feet: the fore-feet are armed with four claws, the two middle ones are the longeſt; and thoſe behind have five claws. The hair of his head and body is black and white; this animal turns his tail up on his back, and covers his whole body with it, when he is inclined to ſleep, or wiſhes to ſhelter himſelf from the rain or the heat of the ſun. The long hair of his tail and of his body is not round in all its extent: it is flat towards the end, and feels like dry graſs. He waves his tail frequently and haſtily when he is irritated, but it hangs down when he is compoſed, and he ſweeps the ground with it as he goes. The tamanoir walks ſlowly: a man can eaſily overtake him in running: his feet ſeems leſs calculated to walk than to climb, and to faſten round bodies; and he holds a branch or a ſtick ſo faſt, that it is impoſſible to ſnatch either from him.

The ſecond of theſe animals is that which the Americans called only tamandua, and to whom we ſhall give this name: he is much ſmaller than the tamanoir: he is not above eighteen inches from the extremities of the ſnout to the rump: his head is five inches long, his ſnout crooked, and flat and long below. He has a tail ten inches long, without hair at the end: his ears are erect and about an inch long, his tongue is round, and eight inches long, placed in a ſort of gutter or hollow canal within the lower jaw: his legs are not above four inches long: his feet are of the ſame form, and have the ſame number of claws as thoſe of the tamanoir. He climbs up, and holds a branch or a ſtick faſt, like the tamanoir, and his march is equally ſlow. He does not cover himſelf with his tail, which cannot ſhelter him, being almoſt bare; the hair of the fore-part is ſhorter than that of the tamanoir; when he ſleeps he hides his head under his neck and his fore-legs.

The third of theſe animals is that which the naturaliſts of Guiana call ouatiriouaou, unto which we appropriated the name of fourmiller, or ant-eater, to diſtinguiſh him from the tamanoir and tamandua. He is ſtill much ſmaller than the tamandua, being not above ſix or ſeven inches long from the extremities of the ſnout to the tail: his head is two inches long: the ſnout is not near ſo long as that of the tamanoir, or the tamandua: his tail is ſeven inches long, but is bent and is bare at the end: his tongue is narrow, long, and flat: his neck is almoſt bare, the head is large in proportion to the body, his eyes placed low, at a little diſtance from the corners of the mouth, his ears are ſmall, and hidden by the hair: his legs are but three inches high, his fore-feet have no more than two claws, of which the exterior is much longer than the interior: his hind-feet have four claws. He feels ſmooth, his colour is ſhining, diverſified with red and yellow: his feet are not made to walk, but to climb up, and to take hold of branches of trees, on which he hangs himſelf by the extremity of the tail.

Theſe three animals, ſo different in the ſize and proportions of the body, have, nevertheleſs, many things in common, with regard to conformation and their natural inſtinct. All three feed upon ants, and ſuck honey and other liquid and viſcous ſubſtances: they gather crums of bread and ſmall pieces of meat with great dexterity: they are eaſily tamed and domeſticated: they can ſubſiſt a long while without food: they do not ſwallow all the liquor which they keep in their mouth, one part of it iſſues out of their noſtrils: they commonly ſleep in the day time, and change their ſtation in the night: they are ſo ſlow, that a man may overtake them eaſily whilſt running in open ground. The ſavages eat their fleſh, which has a diſagreeable taſte.

The tamanoir looks at a diſtance like a great fox, and for that reaſon ſome travellers call him the American fox. He is ſtrong enough to defend himſelf againſt a large dog, and even a jaguar. When he is attacked he fights ſtanding on his hind-legs, like the bear, and makes uſe of his fore-claws, which are murdering weapons, for his protection. He then lies on his back to uſe his hind-legs, and in this ſituation he is almoſt invincible; and even after he has put his adverſary to death, he keeps his hold a long time. He is covered with long buſhy hair, and a very thick ſkin; beſides, his fleſh is remarkably hard, and he ſeldom loſes his life in theſe engagements.

The tamanoir, the tamandua, and the fourmillier, are natives of the hotteſt climates only of America. They are found in Braſil, in Guiana, and in the country of the Amazons, &c. They do not breed in Canada, nor in other frozen regions of the New World, and do not belong conſequently to the Ancient Continent.

The Pangolin and Phatagin; or the ſhort and long-tailed Manis.

Theſe animals are commonly known under the name of ſcaly lizards; but we think proper to reject this denomination; 1, becauſe it is a compound; 2, becauſe it is ambiguous, and applied to both ſpecies; becauſe theſe animals are not only of another kind, but even of another claſs than the lizards, which are oviparous reptiles, while the pangolin and the phatagin are viviparous quadrupeds.

All

All the lizards are wholly covered, even under the belly, with a ſleek ſpeckled ſkin, like ſkales, but the pangolin and the phatagin have no ſcales under their throat, on the breaſt, or the belly. The phatagin, however, like the other quadrupeds, has hair on all theſe under parts of the body; but the pangolin has nothing but a ſmooth ſkin without hair. The ſcales with which all the other parts of the body of theſe two animals are covered, do not ſtick to the ſkin. They only adhere to it below; and they are moveable like the prickles of the porcupine. Theſe ſcales are ſo large, ſo hard, and ſo ſharp, that they frighten and diſcourage all animals of prey. It is an offenſive armour which wounds while it reſiſts.

The moſt cruel and the moſt voracious animals, ſuch as the tiger and the panther, make but uſeleſs efforts to devour theſe armed animals. They tread upon them, roll them, but when they attempt to ſeize them, they are grievouſly wounded. They can neither terrify them by violence, nor cruſh them with their weight.

When the pangolin and the phatagin contract themſelves, they do not, like the hedge-hog, aſſume a globular and uniform figure. They form an oblong coat of armour; but their thick and long tail remains outward, and incircles their bodies. This exterior part, by which it ſeems theſe animals might otherwiſe be ſeized, carries its own defence. It is covered with ſcales equally hard and ſharp with thoſe which cover the body, and as it is convex above, and flat below, in the form of half a pyramid, the ſides are covered with ſquare ſcales folded in a right angle, as thick and as ſharp as the others. Hence the tail ſeems to be ſtill more ſtrongly armed than the body, the under parts of which are unprovided with ſcales.

The pangolin, or ſhort-tailed manis, is larger than the phatagin, or long-tailed kind; his fore-feet are covered with ſcales, but the phatagin's feet, and part of his fore-legs have none, being only clothed with hair. The pangolin has alſo larger ſcales, thicker, more convex, and not ſo cloſe as thoſe of the phatagin, which are armed with three ſharp points. The ſcales of the pangolin on the contrary, are without points, and uniformly ſharp. The phatagin is hairy upon the belly, and the pangolin has no hair on that part of the body, but between theſe ſcales which cover his back, there are ſome thick and long hair like the briſtles of a hog, which are not found on the back of the phatagin.

The pangolin is from ſix to eight feet long, including his tail, which is very near as long as the body, though it appears ſhorter when young. The ſcales are not then ſo large nor ſo thick, and are of a pale colour, which is deeper when the animal is adult: they acquire ſuch a hardneſs, that they reſiſt a muſket ball. Like the ant eaters, the pangolin and the phatagin live chiefly upon ants: they have alſo a very long tongue, a narrow mouth, and appear to be without teeth. Their body and their tail are alſo very long, and the claws of their feet very near of the ſame length and the ſame form, but equal in number. The ant-eaters are found in America. The pangolin and the phatagin in the Eaſt Indies, and in Africa, where the negroes call them quogelo, and eat their fleſh, which they reckon a wholeſome food. They alſo uſe their ſcales for different purpoſes. The pangolin, and the phatagin have nothing diſagreeable but their figure; they are gentle, harmleſs, and innocent: they feed upon inſects only: they never run faſt, and can only eſcape the purſuit of men by hiding themſelves in hollow rocks, or, in holes which they dig for themſelves. They are two extraordinary ſpecies, not numerous, nor very uſeful; and their odd form ſeems to rank them as an intermediate claſs betwixt the quadrupeds and the reptiles.

The Armadillo.

When a quadruped is mentioned, the very name carries the idea of an animal covered with hair; and yet nature, as if willing to deviate from this characteriſtic uniformity, very frequently aſtoniſhes us by uncommon productions. The quadruped animals, which we regard as the firſt claſs of living nature, and who are, next to man, the moſt remarkable beings of this world, are not ſuperior in every thing, nor ſeparated by conſtant attributes. The firſt of theſe characters, which conſtitutes their name, and which conſiſts in having four feet, is common to lizards, frogs, &c. which, however, differ from the quadrupeds in many other reſpects, and form a diſtinct claſs. The ſecond general property, to produce young alive, is not peculiar to quadrupeds, ſince it is common with whales and other fiſhes of that claſs. And the third attribute, that of being covered with hair, exiſts not in ſeveral ſpecies, which cannot be excluded from the claſs of the quadrupeds, ſince, this characteriſtic excepted, they agree with them in every other reſpect.

Under the general name of armadillo, we may reckon ſeveral ſpecies which ſeem to us really diſtinct; in all of which the animal is protected by a cruſt that reſembles bone. This cruſt externally covers the head, the neck, the back, the flanks, the buttocks, and the tail to the very extremity. It is covered by a thin ſkin, ſleek and tranſparent: the throat, the breaſt, and the belly, which preſent a white grainy ſkin, like that of a plucked fowl. Beſides by viewing theſe parts with attention, you will perceive the appearance of ſcales which are of the ſame ſubſtance as the cruſt. This cruſt however, is not of one piece, like that of the turtle; it conſiſts of ſeveral joined to each other by as many membranes, which put this armour in motion. The number of theſe natural bands does not depend on the age of the animal; for the young armadillo and the adults, have in the ſame ſpecies the ſame number. Father d'Abbeville has diſtinguiſhed ſix ſpecies of the armadillo, but the principal difference between them conſiſts in the number of diviſions in the armour of the different ſpecies.

The armadilloes in general are innocent, harmleſs animals; but if they can get into gardens, they will eat melons, potatoes, pulſe, and roots. Though originally natives of the hot climates of America, they live in temperate regions. I once ſaw one in Languedoc, which was fed at home, and went every where without doing any damage or miſchief. They walk quickly, but they can neither leap, run, nor climb up trees. They have then no other reſources but to hide themſelves in their holes, or, if they are at too great a diſtance from them, they contrive to dig one before they are overcome; for they are as expert as the mole herſelf in digging the ground. They are ſometimes caught by the tail before they are out of ſight, in which caſe they make ſuch a reſiſtance, that the tail is broken without bringing out the body. In order, therefore to take them without mutilation, the burrow muſt be opened.

When they find themſelves in the hand of the purſuers, they roll themſelves up into a ball; and are placed near the fire, to force them to ſtretch out their coat of mail; which, hard as it is, as ſoon as it is touched with the finger, the animal receives ſo quick an impreſſion, that he contracts in an inſtant. When they are in deep burrows, the method of forcing them out is to ſmoke them, or to let water run down the hole. Some pretend, that they remain under ground above three months without venturing out. It is true, that they remain in their holes in the day-time, and never go out but in the night to ſeek for their ſubſiſtence. The armadillo is hunted with ſmall dogs, that ſoon overtake him; but he ſtops before they have reached him, and contracts himſelf; in which condition he is carried off. If he finds himſelf on the brink of a precipice, he eſcapes the dogs and the huntſmen, by rolling himſelf up, and falling down like a ball without injury or prejudice to his ſcales.

Theſe animals are fat, and very prolific. The female brings forth, as it is reported, four young ones every month, which makes their ſpecies very numerous. They are good to eat, and are eaſily taken with ſnares laid for them on the banks of rivers, and in the marſhy grounds, which they prefer to every other place. It is pretended, that they are not afraid of the bite of the rattle-ſnake, and that they live in peace with theſe reptiles, which are often found in their holes. The ſavages make baſhets, boxes, and other ſmall veſſels of their ſcales.

The Paca, or Spotted Cavy.

The Paca, or Spotted Cavy, is an animal of the New World, who digs a burrow like a rabbit, to which he has been compared, though there is ſcarcely any likeneſs between them. He is much larger than the rabbit, and even than the hare; he has a round head, and a ſhort ſnout; he is fat and bulky, and, by the form of his body, he is more like a pig, in grunting, waddling, and the manner of eating; for he grubs up the earth like the hog, to find his ſubſiſtence. Theſe animals inhabit the banks of rivers, and are found in damp and hot places of South America. Their fleſh is very good to eat, and exceſſively fat. Their ſkin is eaten like that of a pig, for which reaſon a perpetual war is carried on againſt theſe animals. Huntſmen find it very difficult to take them alive; and when they are ſurpriſed in their burrows, which have two openings, they defend themſelves with great obſtinacy and bite with exceſſive fury. Their ſkin, though covered with ſhort and rough hair, is valuable becauſe it is ſpotted on the ſides. Theſe animals bring forth young in abundance. Men and animals of prey deſtroy a great quantity of them, and yet the ſpecies is ſtill numerous. They are peculiar to South America, and are not to be met with in the Old Continent.

The Opoſſum.

The Opoſſum is an animal of America, which is eaſily diſtinguiſhed from all others by two ſingular characters. The firſt is, that the female has under the belly a large cavity, where ſhe receives, and ſuckles her young. The ſecond is, that the male and the female have no claws on the great toe of the hind feet, which are ſeparated from the others, as the thumb in the hand of a man, whilſt the other toes are armed with crooked claws, as in the feet of other quadrupeds.

The opoſſum is only found in the ſouth parts of the New World; but it does not conſtantly dwell in the hotteſt climates. It is found not only in Braſil, Guiana, and Mexico, but alſo in Florida, Virginia, and other temperate regions of this continent. It produces often, and a great number of young each time. Moſt authors ſay, four or five young; others, ſix or ſeven. Marcgrave affirms, that he has ſeen ſix young living in the bag of the female; they were about two inches long, they were already very nimble, they went in and out of the bag many times in a day; they are ſtill ſmall when they are juſt brought forth. Some travellers ſay, that they are not larger than flies when they go out of the womb into the bag, and ſtick to the paps. This fact is not ſo much exaggerated as ſome may imagine, for we have ſeen in an animals, whoſe ſpecies is like that of the opoſſum, young ones ſticking to the paps no larger than a bean. Hence we may preſume, that in theſe animals the womb is only the place of conception, of the formation, and of the firſt unfolding of the fœtus, which increaſes in the bag.

The young opoſſums ſtick to the paps of the dam till they have acquired ſtrength enough to move eaſily. This is a well authenticated fact, nor is it peculiar to this ſpecies only. Some authors pretend, that they ſtick to the paps for ſeveral weeks; others ſay, that they remain in the bag only the firſt month after they proceed from the womb. One may eaſily open this bag, obſerve, count, and even feel the young without diſturbing them. They will not leave the pap, which they hold with their mouth, but when they are ſtrong enough to walk; then they fall into the bag, and go out, and ſeek for their ſubſiſtence. They go in again to ſleep, to ſuckle, and to hide themſelves when they are terrified. When the mother flies, and carries in it the young, her belly does not ſeem bigger when ſhe breeds than uſual, for in the time of the true geſtation, one can ſcarce perceive her to be pregnant.

From the mere inſpection of the form of the feet of this animal, it is eaſy to judge, that it walks awkwardly, and ſeldom runs. One walking moderately may eaſily outſtrip it. It climbs up trees with great facility, hides itſelf in the leaves to catch birds, or hangs itſelf by the tail, the extremity of which is muſcular, and flexible as the hands, ſo that it may ſqueeze, and even incurvate all the bodies it ſeizes upon. It ſometimes remains a long time quiet in this ſituation. Its body hangs with the head downward, when it ſilently waits for its prey. At other times, it balances itſelf to jump from one tree to another like the monkeys which it reſembles both in having a large and flexible tail, and in the conformation of its feet. Though it be voracious, and even greedy of blood, which it ſucks with avidity, it feeds alſo upon reptiles, inſects, ſugar-canes, potatoes, roots, and even leaves and bark of trees. It may be fed as a domeſtic animal. It is neither wild nor ferocious. It is eaſily tamed, but its nauſeous ſmell is more offenſive than that of the fox. Its figure is alſo forbidding; for independently of its ears, which reſemble thoſe of an owl, of its tail, which reſembles that of a ſerpent, and of its mouth, which is cleft to the very eyes, its body appears always very dirty, becauſe its hair is neither ſmooth nor curled, but tarniſhed, as if covered with dirt. The bad ſmell of this animal reſides in the ſkin, for its fleſh is palatable. The ſavages hunt this animal, and feaſt on its fleſh with avidity.

The Marmoſe, or Murine Opoſſum.

The marmoſe, or murine oppoſſum reſembles in moſt reſpects the latter ſpecies. They are natives of the ſame climate, in the ſame continent, and are very much alike by the form of the body, the conformation of the feet, and the tail, a part of which is covered with ſcales, the upper part only being hairy. But the marmoſe is ſmaller than the common opoſſum, his ſnout is ſtill ſharper; the female has no bag under the belly, ſhe has only two looſe ſkins near the thighs, between which the young ſtick to the paps. When the young are brought forth, they are not ſo large as ſmall beans. The brood of the marmoſe is very numerous; we have ſeen ten ſmall marmoſes, each ſticking to a pap, and the dam had ſtill four paps unoccupied. I am perſuaded, that theſe animals bring forth a few days after the conception. The young are then fœtus only, which are not come to the fourth part of their growth. The dam always miſcarries, and the fœtuſes ſave their lives in ſticking to the paps, without leaving them till they have acquired the growth and ſtrength which they would naturally get in the womb.

The Cayopollin, or Mexican Opoſſum.

The cayopollin, or Mexican opoſſum according to Fernandes is a ſmall animal, little larger than a rat, very much reſembling the opoſſum in the ſnout, the ears, and the tail, which is thicker and ſtronger than that of a rat. He makes uſe of it, as we do of our hands. He has thin tranſparent ears. His belly, legs, and feet, are white. The young, when they are frightened, embrace the mother, who lifts them up on the trees. This ſpecies has been found on the mountains of New Spain.

CHAP. XVI.

OF THE ELEPHANT—THE RHINOCEROS—THE CAMEL AND DROMEDARY—THE BUFFALO, THE URUS, THE BISON, AND THE ZEBU.

The Elephant.

THE human race excepted, the elephant is the moſt reſpectable of animals. In ſize he ſurpaſſes all other terreſtrial creatures, and in underſtanding is only inferior to man. Of all the brute creation, the elephant, the dog, the ape, and the beaver are moſt admirable for ſagacity; but the genius of the dog is only borrowed, being inſtructed by man in almoſt every thing he knows. The monkey has only the appearance of wiſdom, and the beaver is only ſenſible with regard to himſelf, and his ſpecies. The elephant is ſuperior to them all three: he unites all their moſt eminent qualities. The hand is the principal organ of the monkey's dexterity. The elephant with his trunk, which ſerves him inſtead of arms and hands, with which he can lift up, and ſeize the ſmalleſt, as well as the largeſt objects, carry them to his mouth, place them on his back, hold them, or throw them far off, has the dexterity of the monkey, and the tractableneſs of the dog. He is like the latter ſuſceptible of gratitude, and capable of a ſtrong attachment.

He uſes himſelf to man without reluctance, and ſubmits to him, not ſo much by force, as good treatment. He ſerves him with zeal, intelligence, and fidelity: in fine, the elephant, like the beaver, loves the ſociety of his equals, and renders himſelf agreeable to them. They are often ſeen to aſſemble together, to diſperſe, and to act in concert. If they do not erect buildings, and do not work in common, it is, perhaps, for want of room only, and tranquillity; for men in the earlieſt periods multiplied in all the regions inhabited by the elephant. Hence he conſequently lives in fear and anxiety, and can no where find a ſpace large and ſecure enough to eſtabliſh his habitation on a ſettled ſpot. Every being in nature has his real price, and relative value. In order to judge of both in the elephant, we muſt allow him at leaſt the judgement of the beaver, the dexterity of the monkey, the ſentiment of the dog, and the peculiar advantages of ſtrength, ſize, and longevity. We muſt not forget his arms, or his defence, with which he can pierce through, and conquer the lion. He ſhakes the ground at every ſtep: with his trunk he eradicates trees: with the ſtrength of his body he makes a breach in a wall: terrible by his force, he is invincible by the reſiſtance only of his enormous maſs, and by the thickneſs of the leather which covers it. On his back he carries a tower replete with armed hoſts. He alone drags machines, which ſix horſes cannot move. To this prodigious ſtrength he joins courage, prudence, coolneſs, and an exact obedience. He preſerves moderation even in his moſt violent paſſions: he is more conſtant than impetuous in love: in anger he does not forget his friends: he never attacks any but thoſe who have given offence: he remembers favours as long as injuries: feeding chiefly upon vegetables, he is not naturally an enemy to other animals. Hence he is an univerſal favourite. The ancients conſidered the elephant as a prodigy of nature; they exaggerated his natural faculties; and they attributed to him, not only intellectual qualities, but moral virtues.

In a wild ſtate, the elephant is neither bloody nor ferocious; his manners are ſocial, and he ſeldom wanders alone. The oldeſt leads the herd, the next in age drives them, and forms the rear: the young and the weak are in the middle. The females carry their young, and hold them cloſe with their trunks. They only obſerve this order, however, in perilous marches, when they go to feed on cultivated lands. In foreſts and ſolitary places they are cautious, but ſtill keeping at ſuch a moderate diſtance from each other, as to be able to give mutual aſſiſtance, and ſeaſonable warning in caſe of danger. Some, however, ſtraggle, and remain behind the reſt; which alone are attacked by the huntſmen, for it would take an army to conquer a whole herd. It is even dangerous to do them the leaſt injury, they go ſtrait to the offender, and notwithſtanding the weight of their body, they walk ſo faſt that they eaſily overtake the lighteſt man in running. They pierce him through with their tuſks, or ſeize him with their trunks, throw him againſt a ſtone, and tread him under their feet; but it is only when they have been provoked, that they become ſo furious and implacable. It is ſaid, that when they have been once attacked by men, or have fallen into a ſnare, they never forget it, and ſeek for revenge on all occaſions. As they have perhaps a more exquiſite ſenſe of ſmelling than any other animal, owing to the large extent of their noſe, they ſmell a man at a great diſtance, and can eaſily follow him by the tract. Theſe animals are fond of the banks of rivers, deep valleys, ſhady places, and marſhy grounds; they cannot ſubſiſt long without water, and make it thick and muddy before they drink. They often fill their trunks with it, either to convey it to their mouth, or only to cool their noſe, and to amuſe themſelves in ſprinkling it around them. They cannot ſupport cold, and they ſuffer equally from exceſſive heat, for to avoid the burning rays of the ſun, they penetrate into the thickeſt foreſts: they alſo bathe often in the water; and the enormous ſize of their body is rather an advantage to them in ſwimming. Beſides, the length of their trunk, which they erect, and through which they breathe, prevents their being drowned.

Their common food is roots, herbs, leaves, and young branches; they alſo eat fruit and corn, but they diſlike fleſh and fiſh. When one of them finds good paſture, he has the generoſity to invite the reſt to participate with him. As they need a great quantity of fodder, they often change their place, and when they find cultivated lands, they make prodigious havock. Their bodies being of an enormous weight, they deſtroy ten times more with their feet, than they conſume for their food, which may be reckoned at the rate of one hundred and fifty pounds of graſs every day. As they never feed but in great numbers, they conſume a large territory in about an hour's time. The Indians and the Negroes therefore, ever attentive to their property, have recourſe to every expedient in order to expel them from their territories. This ſagacious animal on the other hand, no leſs intent upon its prey, is generally ſucceſsful in carrying off its booty. It is difficult to frighten them, as they are ſcarce ſuſceptible of fear. Nothing can ſtop them but fire works, and crackers thrown amongſt them, the ſudden effect of which, often repeated, forces them ſometimes to retreat. It is very difficult to part them, for they commonly attack their enemies all together, proceed unconcerned, or turn back.

The female elephant goes two years with young; during which the male never copulates with her. They only bring forth a young one, which has teeth as ſoon as brought forth, and is then larger than a boar; yet his tuſks are not viſible, they appear ſoon after, and at ſix months old, are ſome inches long. At that age, the elephant is larger than an ox, and the tuſks continue to increaſe till he is advanced in years.

It is very eaſy to tame the elephant. As he is the ſtrongeſt and moſt rational, he is the moſt uſeful of animals; but he ſeems to be ſenſible of his ſervile condition, for he never generates in a domeſtic ſtate.

There is no domeſtic elephant but has been wild before, and the manner of taking, taming, and ſubjecting them, deſerves particular attention. In the middle of foreſts, and in the vicinity of the places which they frequent, they chuſe a large ſpace which they encircle with palliſadoes. The ſtrongeſt trees of the foreſt ſerve inſtead of ſtakes, to which they faſten croſs pieces of timber, which ſupport the other ſtakes. A man may eaſily paſs through this palliſado. There is another great opening, through which the elephant may enter, with a trap hanging over it, or a gate which is ſhut behind him. To bring them to that incloſure, he muſt be enticed by a tame female in rut; and when her leader thinks ſhe is near enough to be heard, he obliges her to indicate by her cries, the condition ſhe is in. The wild male anſwers immediately,

ately, and begins his march to join her. She repeats her call now and then, and arrives firſt to the firſt incloſure, where the male following her track, enters through the ſame gate. As ſoon as he perceives himſelf ſhut up, his ardour vaniſhes, and when he diſcovers the huntſmen, he becomes furious. They then entrap him with ropes; they fetter his legs and his trunk, they bring two or three tame elephants, and try to tie them with the wild one, and at laſt, by dint of dexterity, ſtrength, terror, and careſſes, in a few days they render him tame.

The elephant once tamed, becomes the moſt tractable and the moſt ſubmiſſive of all animals. He conceives an affection for his leader, he careſſes him, and ſeems to gueſs whatever can pleaſe him. In a little time he underſtands the ſigns, and even the expreſſion of ſounds. He diſtinguiſhes the tone of command, that of anger or good-nature, and acts accordingly: he never miſtakes the words of his maſter: he receives his orders with attention, executes them with prudence and eagerneſs, without precipitation; for his motions are always meaſured, and his character ſeems to participate of the gravity of his body. He is eaſily taught to bend the knee to aſſiſt thoſe who will ride on his back. He careſſes his friends with his trunk, and ſalutes with it the perſons he is directed to take notice of. He makes uſe of it to lift burdens, and helps to load himſelf. He has no averſion at being clothed, and ſeems to delight in a golden harneſs or magnificent trappings. He is eaſily put to the traces of carts, and draws ſhips upon occaſion. He draws evenly, without ſtopping, or any marks of diſlike, provided he is not inſulted by unſeaſonable correction, and that his driver ſeems to be thankful for the ſpontaneous exertion of his ſtrength. His leader is mounted on his neck, and makes uſe of an iron rod crooked at an end, with which he ſtrikes him gently on the head to make him turn or increaſe his pace; but often a word is ſufficient, eſpecially, if he has had time to make himſelf well acquainted with his leader, and has a confidence in him. His attachment is ſometimes ſo ſtrong, and ſo laſting, and his affection ſo great, that he generally refuſes to ſerve under any other perſon, and he is known to have died of grief for having killed his governor.

The ſpecies of the elephant is numerous, though they bring forth but one young once in two or three years. The ſhorter the life of animals is, the more they multiply. In the elephant, the length of his life compenſates the ſmall number; and if it is true, as has been affirmed, that he lives two hundred years, and that he begets when he is one hundred and twenty years old, each couple brings forth forty young in that time. Beſides, having nothing to fear from other animals, and little even from men, who take them with great difficulty, the ſpecies has not decreaſed, and is generally diſperſed in all the ſouthern parts of Africa and Aſia.

From time immemorial the Indians made uſe of elephants in war. Amongſt thoſe nations unacquainted with the European military diſcipline, they were the beſt troop of their armies; and while battles were decided by mere weapons, they generally obtained the victory. We find however that the Greeks and Romans had the addreſs to vanquiſh thoſe monſters of war. They opened their ranks to let them go through; and did not attempt to wound them, but ſhowered their darts againſt their leaders, who were forced to ſurrender, and to calm the elephants when ſeparated from their troops. But now that fire is become the element of war, and the principal inſtrument of death, the elephants, who are afraid of the noiſe and the fire of the artillery, would be an incumberance in battle, and more dangerous than uſeful.

In thoſe happy regions, however, where our fatal inſtruments are ſcarcely known, they ſtill bring elephants to the field. At Cochin, and in the other parts of Malabar, they do not make uſe of horſes, and all who do not fight on foot are mounted on elephants. In Tonquin, Siam, and Pegu, the king, and all the grandees, never ride but upon elephants. On feſtival days they are preceded and followed by a great number of theſe animals covered with the richeſt ſtuffs. On comparing the relations of travellers and hiſtorians, it appears that in the former quarter of the globe, they are not ſo wild as in the eaſtern, and often with an impatient air, they venture to approach the abodes of men.

In general, however, the elephants of Aſia are larger and ſtronger than thoſe of Africa, particularly thoſe of Ceylon, who exceed in courage and ſagacity all thoſe of Aſia. Probably they owe theſe qualifications to their education, more improved in Ceylon than any where elſe. The elephants of the Indies eaſily carry burdens of three or four thouſand weight. The ſmalleſt, that is, thoſe of Africa, lift up freely with their trunks burdens of two hundred pounds weight, and place them on their ſhoulders. They take in this trunk a great quantity of water, which they throw out around them, at ſeven or eight feet diſtance. They can carry burdens of more than a thouſand weight upon their tuſks: with their trunk they break branches of trees, and with their tuſks they root out the trees. One may judge of their ſtrength by their agility, conſidering at the ſame time the bulk of their body. They walk as faſt as a ſmall horſe on the trot, and when they run, they can keep up with a horſe on full gallop, which ſeldom happens in their wild ſtate, except when they are provoked by anger, or frightened. The tame elephants travel fifteen or twenty leagues a day without being fatigued; and when they are hurried, they may travel thirty-five or forty leagues. They are heard at a great diſtance, and may eaſily be followed by the evident traces which their feet leave upon the ground, and which are fifteen or eighteen inches diameter.

When the elephant is taken care of, he lives a long time in captivity. According to ſome he lives four or five hundred years. Others, again mention two or three hundred; the moſt credible, one hundred and twenty, thirty, and even one hundred and fifty years. I take this laſt opinion to be the neareſt to truth; whatever care, however, is taken of the elephant, he does not live long in temperate countries, and ſtill ſhorter in cold climates. The elephant which the king of Portugal ſent to Louis XIV. in 1668, and which was then but four years old, died in his ſeventeenth, in January 1681, and lived only thirteen years in the menagerie of Verſailles, where he was treated with care and tenderneſs, and fed with profuſion. He had every day four pounds of bread, twelve pints of wine, two buckets of porridge, with four or five pounds of bread, two buckets of rice boiled in water, without reckoning what was given to him by viſitors. He had, beſides, every day one ſheaf of corn to amuſe himſelf with; for, after he had eaten the corn ears, he made a kind of whip of ſtraw, and uſed it to drive away the flies. He delighted in breaking the ſtraw in ſmall bits, which he did with great dexterity with his trunk; and, as he was led forth to walk every day in the fields he devoured graſs.

The common colour of the elephant is aſh-grey, or blackiſh. White ones are extremely ſcarce; ſome have been ſeen at different times in the Indies, where there are alſo ſome of a reddiſh colour.

The elephant has very ſmall eyes, comparatively with his enormous ſize, but they are ſenſible and lively; and what diſtinguiſhes them from thoſe of every other animal, is, their pathetic ſentimental expreſſion. He ſeems to reflect, to think, and to deliberate; and never acts till he has examined and obſerved ſeveral times, without paſſion or precipitation, the ſigns which he is to obſerve. Dogs, whoſe eyes have much expreſſion, are animals too lively to diſtinguiſh their ſucceſſive ſenſations; but as the elephant is naturally grave and ſedate, one may read in his eyes his interior affections.

He has a quick hearing, and this organ is outwardly like that of ſmelling, more marked in the elephant than in any other animals. His ears are very large, even in proportion to his body: they are flat, and cloſe to the head, like thoſe of a man: they commonly hang down, but he raiſes them up, and moves them with great eaſe he makes uſe of them to wipe his eyes, and to cover them againſt the inconveniency of flies and duſt. He delights in the ſound of inſtruments, and ſeems to like muſic: he ſoon learns to beat time, and to move accordingly. He ſeems animated by the beat of the drum, and the ſound of trumpets: he has an exquiſite ſmell, and is paſſionately fond of perfumes of all ſorts, and of fragrant flowers, which he firſt uſes for noſe-gays, and then conveys them to his mouth as if about to taſte them.

His ſenſe of feeling centers in his trunk, which being compoſed of membranes, nerves, and muſcles, is an organ of ſenſe: and which he can not only move and bend, but which he can ſhorten, lengthen, and turn any way. The extremity of this trunk terminates by an edge, which projects above like a finger, with which he picks up the ſmalleſt pieces of money from the ground, gathers nuts and flowers, unties knots, opens and ſhuts doors, by turning the keys, and draws regular characters with an inſtrument as ſmall as a pen.

Although the elephant has a more retentive memory, and more intelligence than any other animal, he has a ſmaller brain than moſt of them. He is, at the ſame time, a miracle of intelligence, and a monſter of matter. His body is very thick, without any ſuppleneſs. His neck is ſhort, and very ſtiff: his head is ſmall and deformed: his ears are of an exceſſive diameter; and his noſe is of a ſtill more diſproportionate length: his eyes are too ſmall, as well as his mouth: his legs are like maſſive pillars, ſtrait and ſtiff: his feet are ſo ſhort and ſo ſmall, that he ſeems to have none; his ſkin is hard, thick, and callous. All theſe deformities are remarkable, as all of them are exhibited in large; and they are more diſagreeable to the eye, as moſt of them are unparalelled in the creation; no other animal having either the head, the feet, the noſe, the ears, or the tuſks, like thoſe of the elephant.

The elephant is alſo ſingular in the conformation of the feet, and the texture of the ſkin. He has very little hair on his body, but a conſiderable deal on the eye-lids, on the back part of the head, within the ears, and on the thighs and the legs. The epidermis, or outſide ſkin, hard and callous, has two ſorts of wrinkles, ſome hollow, others prominent. In man, and other animals, the epidermis ſticks every where cloſe to the ſkin. In the elephant, it is only faſtened by ſome points, like two quilted ſtuffs one above the other. This epidermis is naturally dry and ſoon acquires three or four lines of thickneſs, by the cruſts which are generated one above the other drying up. It is this thickneſs of the epidermis which produces the *elephantiaſis*, or dry leproſy, to which man, whoſe ſkin is bare, like that of the elephant, is ſometimes ſubject. This diſtemper is very common to elephants; and, to prevent it, the Indians take care to rub them often with oil, and to preſerve the ſkin ſupple by frequent bathing. It is rather tender where it is not callous; and the elephant is ſo fearful of the ſting of the flies, that he not only employs his natural motions, but even the reſources of his intelligence, to get rid of them. He makes uſe of his tail, of his ears, of his trunk, to ſtrike them. He likewiſe contracts his ſkin wherever he can, and ſqueezes them to death betwixt his wrinkles. He cleans his ſkin by rubbing it with pumice ſtones, and then pours perfumed oil and colours upon it. The conformation of the feet and legs is alſo ſingular, and different in the elephant from that of other animals. The fore legs ſeem to be higher than thoſe behind, yet the hind legs are the longeſt. They are not bent like the hind legs of a horſe, or an ox, the thighs of which ſeem to be of the piece with the buttocks. Their knee is very near the belly, and the foot is ſo high, and ſo long, that it ſeems to make a great part of the leg. In the elephant, on the contrary, this part is very ſhort, and touches the ground; he has the knee, like man, in the middle of the leg, not near the belly. This ſhort and ſmall foot, is divided into five toes, which are all covered with a ſkin; but one ſees only a ſort of claws, the number of which varies, though that of the toes is conſtant; for he has always five to each foot, and for the moſt part five claws; but ſometimes he has no more than four, or even three; and, in this caſe, they do not correſpond exactly with the extremity of the fingers.

The elephants tail is hardly ſo long as either of his ears. Each of them is near three feet long, and is rather thin, ſharp, and garniſhed at the extremity with a tuft of large, black, ſhining, and ſolid briſtles, which are as ſtrong as wire; and a man cannot break them with his hand, though they are elaſtic and pliant. This tuft of hair is an ornament which the Negro women are particularly fond of; and they attribute to it ſome particular virtue, according to their ſuperſtitious notions. Hence an elephant's tail is ſometimes ſold for two or three ſlaves; and the Negroes often riſk their lives to ſnatch it from the living animal.

The largeſt elephants of the Indies, and the eaſtern coaſts of Africa, are fourteen feet high; the ſmalleſt, which are found in Senegal, and in the other weſtern parts of Africa, are not above ten or eleven feet; and thoſe which have been brought young into Europe, were not ſo high. The elephant at the menagerie of Verſailles, which came from Congo, was but ſeven feet and a half high in his ſeventeenth year. During thirteen years that he lived in France, he did not grow above a foot; ſo that, at the age of four, when he was ſent, he was only ſix feet and a half high. Theſe enormous animals ſcour along with great ſpeed; they are ſupported by four members, which are more like pillars, or maſſive columns, from fifteen to eighteen inches in diameter, and five or ſix feet high. Thus, the elephant, with one ſtep to a man's two, will overtake him in running.

In order to give a complete idea of the nature and intelligence of of this animal, we ſhall inſert here ſome particulars communicated to us by the Marquis of Montmirail. The Indians make uſe of the elephant to carry artillery over mountains; and it is then, that he gives the greateſt proofs of his intelligence. He acts in the following manner:—When the oxen, yoked two and two, endeavour to draw the piece of artillery up the mountain, the elephant puſhes the breach of the gun with his forehead; and ſupports the carriage with his knee, which he places near the wheel. When his leader employs him in ſome hard labour he explains his work, and the reaſons that ſhould induce him to comply. If the elephant ſhews an averſion to comply, the *cornca* (ſo his leader is called) promiſes to give him arrack, or ſomething he likes. Upon this the animal agrees to every thing propoſed; but it is dangerous for the *cornca* to forfeit his word. An inſtance of this happened in the Deckan, which deſerves to be recorded; and, however incredible it may appear, is perfectly true. An elephant had been revenged of his cornca in killing him. His wife, witneſs of this cataſtrophe, took her two children, and threw them to the feet of the animal, ſtill furious; telling him, *Since thou haſt killed my huſband, take my life, and that of my children.* The elephant ſtopped ſhort, grew calm, and, as if he had been moved with regret and compaſſion, took with his trunk the largeſt of the two children, placed it on his neck, adopted him for his cornca, and would have no other leader.

If the elephant is vindictive, he is no leſs grateful. A ſoldier of Pondicherry, who commonly carried to one of theſe a certain meaſure of arrack every time that he received his pay, having one day taken a glaſs too much, and ſeeing himſelf purſued by the guard, who threatened to conduct him to priſon, took refuge under the elephant, and ſlept there. It was in vain, that the guard attempted to draw him out from the aſylum; the elephant defended him with his trunk. Next day the ſoldier having become ſober, was ſtruck with terror to lie under an animal of this enormous bulk. The elephant, who, no doubt, perceived his conſternation, careſſed him with his trunk, to remove his fears, and treated him with the greateſt tenderneſs.

The elephant falls ſometimes into a ſort of frenzy, which deprives him of his tractableneſs, and makes him even formidable. He is commonly killed on the firſt ſymptoms of madneſs, for fear of miſchief. Sometimes he is confined in heavy chains, but when he is in his natural ſtate, the moſt acute pain cannot make him injure one who has not offended him. An elephant, furious with the wounds which he had received in battle at Hambour, ran through the fields, and ſhrieked in a moſt hideous manner. A ſoldier, who, notwithſtanding the warning of his companions, could not fly, perhaps, becauſe he was wounded, remained in the way. The elephant moved with a generous compaſſion, took him with with his trunk, placed him gently on one ſide of the road, and continued his march. The gentlemen of the Academy of Sciences have alſo communicated to us ſome facts which they had learned from thoſe who managed the elephant at the menagerie of Verſailles; which it may not be improper to take notice of. "The elephant ſeemed to diſcern when any perſon inſulted him; and he remembered to be revenged the firſt opportunity. Having been baulked by a man, who feigned to throw ſomething into his mouth, he ſtruck him with his trunk, and broke two of his ribs. Afterwards he trampled him under his feet, and broke one of his legs; and, having kneeled down, he tried to thruſt his tuſks into the man's belly, which, however, went into the ground on both ſides of the thigh, which was not wounded. He bruiſed another man, by ſqueezing him againſt the wall, for a ſimilar mockery. A painter was deſirous to draw him in an extraordinary attitude, which was, to keep his trunk erect, and his mouth open. The ſervant of the painter, to make him remain in that attitude, threw fruits into his mouth; but after he deceived him, and as if he had been privy to the whole matter, he was revenged on the painter himſelf by diſcharging a great deal of water from his trunk, which damnified the paper intended for the portrait."

He made leſs uſe of his ſtrength than of his dexterity, which was ſuch, that he untied, with great facility, a double leather ſtring which faſtened his leg, with his mouth, untying it from the buckle's tongue, and after this buckle had a ſmall ſtring twiſted around it, with ſeveral knots, he untied them all, without breaking any thing. One night, that he had thus diſentangled himſelf from his leather ſtrings, he broke open ſo dexterouſly the door of his lodge, that his governor was not awaked by the noiſe. He went thence into divers yards of the menagerie. breaking open the doors that were ſhut, and pulling down the ſtonework, when the paſſage was too narrow for him. After this, he went into the lodges of other animals, terrifying them to ſuch a degree, that they fled to the remoteſt parts of the park for an aſylum. In ſhort, to omit nothing of what may contribute to make all the natural faculties of this animal perfectly known, as well as his acquired knowledge, we ſhall add ſome facts, extracted from the moſt credible authors.

Of five elephants (ſays Tavernier), which huntſmen had taken, three eſcaped, although their bodies and their legs were faſtened with chains and ropes. Theſe men told us a very ſurpriſing circumſtance, if we can believe it, which is, that when once theſe elephants have been caught, and eluded the ſnares of their adverſaries, if they are forced to ſeek refuge in the woods, they are diffident, and break with their trunk a large branch, with which they ſound the ground before they put their foot upon it, in order to diſcover if there be holes in their paſſage. This circumſtance made the huntſmen deſpair of catching the three elephants that had eſcaped. We ſaw the other two which they had caught; each of them was betwixt two tame elephants; and around the wild elephants were ſix men, holding ſpears. They ſpoke to theſe animals in preſenting them ſomething to eat, and telling them, in their language, *Take this, and eat it.* They had ſmall bundles of hay, bits of black ſugar, or rice boiled in water, with pepper. When the wild elephant refuſed to do what he was ordered, the men commanded the tame elephants to beat him, which they did immediately. and if the poor creature ſeemed to retaliate, another ſtruck him; ſo that he was compelled to obey.

I have obſerved ſeveral times (ſays Edward Terry), that the elephant does many things which are rather an indication of reaſon, than of ſimple inſtinct. He does whatever his maſter commands him. If he orders him to frighten any perſon, he advances towards him with the ſame fury as if he would tear him to pieces: and when he comes near him, he ſtops ſhort, and does him no harm. If his maſter wiſhes to affront him, he has only to ſignify it to the elephant, who takes with his trunk dirty water and throws it at his face. The Mogul has elephants for the execution of criminals condemned to death. If their leader bids them diſpatch theſe wretches ſoon, they tear them to pieces in a moment with their feet. But if he command them to make theſe criminals languiſh, they break their bones one after another, and make them ſuffer torments as cruel as thoſe of the wheel.

The Rhinoceros.

Next to the elephant, the rhinoceros is the moſt powerful of all quadrupeds. He is at leaſt twelve feet long, from the extremity of the ſnout to the tail; ſix or ſeven feet high; and the circumference of his body is nearly equal to his length. He is therefore like the elephant in bulk; and if he appears much ſmaller, it is becauſe his legs are much ſhorter in proportion to thoſe of the elephant; but he differs widely from that ſagacious animal, in his natural faculties, and his intelligence. Deprived of all feeling in the ſkin, having no organ anſwering the purpoſe of hands, nor diſtinct for the ſenſe of feeling; he has nothing inſtead of a trunk, but a moveable lip, to which all his dexterity is confined. He is ſuperior to other animals only in ſtrength, ſize, and the offenſive weapon which he carries upon his noſe, and which is peculiar to him. This weapon is a very hard horn, ſolid throughout, and placed more advantageouſly than the horns of ruminating animals, which only protect the ſuperior parts of the head and neck, whilſt the horn of the rhinoceros defends all the exterior parts of the ſnout, and preſerves the muzzle, the mouth, and the face from inſult. Hence the tiger cannot attack him in front, without running the riſk of being devoured. As his body and limbs are covered with an impenetrable ſkin, he diſregards the claws of the tiger and the lion no leſs than the weapons of the huntſman. His ſkin is a dark leather, of the ſame colour, but thicker and harder than that of the elephant: he does not feel the ſting of flies: he cannot contract his ſkin: it is only folded by large wrinkles on the neck, the ſhoulders, and the buttocks, to facilitate the motions of the head and the legs, which terminate in large feet, armed with three great claws. He has the head larger in proportion than the elephant; but his eyes are ſmaller, which never opens entirely. The upper jaw projects above the lower; and the upper lip has a motion, and may be lengthened ſix or ſeven inches. It is terminated by a ſharp edge, which enables this animal, with more facility than other quadrupeds, to gather the graſs, and divide it into handfuls, as the elephant does with his trunk. This muſcular and flexible lip is a ſort of trunk very incomplete, but which is equally calculated for ſtrength and dexterity. Inſtead of thoſe long ivory teeth which form the tuſks of the elephant, the rhinoceros has his powerful horn and two ſtrong inciſive teeth in each jaw. Theſe inciſive teeth, which the elephant has not, are placed at a great diſtance from each other in the jaws of the rhinoceros. He has, beſides theſe, twenty-four ſmaller teeth, ſix on either ſide of each jaw. His ears are always erect; and in form are like thoſe of a hog, only they are larger in proportion to his body, of which they are the only hairy parts. The end of the tail is, like that of the elephant, furniſhed with a tuft of large briſtles, which are very hard and ſolid.

The rhinoceros which arrived in London in 1739, had been ſent from Bengal. Although he was young (being but two years old), the expences of his food, which conſiſted of rice, ſugar, and hay, and his voyage, amounted to near one thouſand pounds ſterling. They gave him every day ſeven pounds of rice mixed with three pounds of ſugar; which they divided into three parts. He had alſo a great quantity of hay and green graſs, which he preferred. His drink was nothing but water, of which he drank a great quantity at once. He was of a quiet diſpoſition, and ſuffered his manager to touch him on all the parts of his body. He grew unruly when he was ſtruck, or was hungry; and in both caſes he could not be appeaſed without giving him ſomething to eat. When he was angry, he leaped forward with impetuoſity and furiouſly beat the walls with his head.

This rhinoceros, when he was two years old, was not much higher than a young cow; but his body was very long, and very thick. The tongue of this rhinoceros was ſoft, like that of a calf: his eyes had no vivacity: they are like thoſe of a hog in form, and are placed very low.

It is certain, that ſome rhinoceroſes have but one horn in the noſe, and others two: it is not equally certain, however, that this variety is conſtant, for it always depends on the climate of Africa, or the Indies. Hence two diſtinct ſpecies of theſe animals may be eſtabliſhed, in conſequence of this difference. It ſeems, that the rhinoceroſes that have but one horn, have it larger and longer than thoſe that have two. There are ſingle horns of three feet and a half, and perhaps of more than four feet, by ſix or ſeven inches in diameter at the baſis; there are alſo double horns which are but two feet in length. Theſe horns are generally brown, or of an olive-colour; yet ſome are grey, and even white. They have only a ſmall concavity, in form of a cup, at their baſis, by which they are faſtened to the ſkin of the noſe; and the remaining part of the horn is ſolid, and very hard. It is with this weapon that the rhinoceros is ſaid to attack, and ſometimes to wound the largeſt elephants, whoſe long legs afford the rhinoceros an opportunity of ſtriking them with his horn under the belly, where the ſkin is tender, and more penetrable; but, if he miſſes the firſt blow, the elephant throws him on the ground, and kills him.

The horn of the rhinoceros is more valued by the Indians than the ivory of the elephant. Not ſo much, however, on account of the matter, of which they make ſeveral works with the chiſſel, but for its ſubſtance, to which they attribute various ſpecific virtues, and medicinal properties. The white ones, as the moſt rare, are alſo thoſe which they value moſt.

The rhinoceros, without being ferocious or carnivorous, or even very wild, is, nevertheleſs, untameable. He is of the nature of a hog, blunt and grunting, without intellects, without ſentiment, and without tractableneſs. Theſe animals are alſo, like the hog, prone to wallow in the mire; they are fond of damp and marſhy places, and ſeldom leave the banks of rivers. They are found in Aſia and Africa, in Bengal, Siam, Laos, in the Mogul dominions, in Sumatra, in Java, in Abyſſinia, in Ethiopia, and about the Cape of Good Hope. But, in general, the ſpecies is not ſo numerous, or ſo univerſally diffuſed, as that of the elephant. The female brings forth but very ſeldom and only one at a time. In the firſt month, the rhinoceros is not much bigger than a large dog; he has not, when firſt brought forth, the horn on the noſe, although the rudiment of it is ſeen in the fœtus. When he is two years old, this horn is only an inch long; and when ſix, it is about ten inches; and, as ſome of theſe horns have been ſeen very near four feet long, they perhaps grow during the whole life of the animal, which it is probable, is about ſeventy or eighty years.

Without being uſeful as the elephant, the rhinoceros is very hurtful, by the prodigious devaſtation which he makes in the fields. The ſkin is the moſt valuable thing of this animal. His fleſh is excellent, according to the taſte of Indians and Negroes. Kolbe ſays, he has often eaten it with great pleaſure. His ſkin makes the beſt and hardeſt leather; and not only his horn, but all the other parts of his body, and even his blood, his urine, and his excrements, are eſteemed as antidotes againſt poiſon, or a remedy againſt ſeveral diſeaſes. Theſe virtues, however, are perhaps only imaginary.

The rhinoceros feeds upon herbs, thiſtles, prickles, ſhrubs, and he prefers this wild food to the ſweet paſture of the verdant meadows; he is very fond of ſugar canes, and eats all ſorts of corn. Having no taſte whatever for fleſh, he does not moleſt ſmall animals, neither fears the large ones, living in peace with them all, even with the tiger, who often accompanies him, without daring to attack him. I doubt, therefore, whether the battles betwixt the elephant and the rhinoceros have any foundation: they muſt, at any rate, ſeldom happen, as there is no notice for war on either ſide. Beſides, no ſort of antipathy has been obſerved to ſubſiſt between them. Some have been ſeen living amicably together, even in a ſtate of captivity.

The rhinoceroſes do not herd together, nor march in troops, like the elephant. They are wilder, and more ſolitary, and perhaps more difficult to be hunted and ſubdued. They never attack men unleſs provoked; but then they become furious, and very formidable. The ſteel of Damaſcus, the ſcymitars of Japan, cannot make an inciſion in his ſkin. The darts and lances cannot pierce him through. His ſkin even reſiſts the balls of a muſket; and thoſe of lead become flat upon his leather, neither can the iron ingots penetrate it. The only places that can be penetrated even with the cuiraſs, are the belly, the eyes, and round the ears. Huntſmen, therefore, inſtead of attacking this animal ſtanding, follow him at a diſtance by his track, and wait to approach him when he either ſleeps or reſts. We have in the King's cabinet a fœtus of a rhinoceros which was ſent from the iſland of Java, and extracted from the body of the dam. It was ſaid, in a memorial which accompanied this preſent, that twenty-eight huntſmen had aſſembled to attack this rhinoceros. They had followed her for ſome days, one or two of them walking now and then before, to reconnoitre the poſition of the animal. By theſe means they ſurpriſed her when ſhe was aſleep, and ſilently approached ſo near her, that they diſcharged, all at once, the contents of their twenty-eight guns into the lower parts of her belly.

This animal has a good ear; it is alſo affirmed, that he has the ſenſe of ſmelling in perfection; but it is pretended, he has not a good eye, and ſees only before him. His eyes are ſo ſmall, and placed ſo low, and ſo obliquely, they have ſo little vivacity and motion, that this fact needs no other confirmation. His voice, when he is mild, reſembles the grunting of a hog; and when he is angry, his ſharp cries are heard at a great diſtance. Though he lives upon vegetables, he does not ruminate. Hence, it is highly probable, that, like the elephant, he has but one ſtomach, and very large bowels, which ſupply the office of the paunch. His conſumption, though very great, is not equal to that of the elephant; and it appears, by the thickneſs of his ſkin, that he loſes leſs than the elephant by perſpiration.

The camel and the dromedary.

Theſe two names do not include two different ſpecies, but only intimate two diſtinct breeds, ſubſiſting from time immemorial, in the camel ſpecies. The only perceptible character by which they differ, conſiſts in the camel having two hunches, or protuberances, and the dromedary only one. The latter is alſo much leſs, and not ſo ſtrong as the camel; but both of them herd and copulate together; and the production from this croſs breed is moſt vigorous, and valuable.

This mongrel iſſue from the dromedary and the camel, form a ſecondary breed, which alſo mix and multiply with the firſt; ſo that in this ſpecies, as well as in that of other domeſtic animals, there are to be found a great variety, according to the difference of the climates where they are produced Ariſtotle has judiciouſly diſtinguiſhed the two principal breeds; the firſt (which has two hunches), by the name of the *Bactrian Camel;* and the ſecond, by that of the *Arabian Camel;* the the firſt are called *Turkman*, and the others *Arabian Camels*. This diviſion ſtill ſubſiſts, with this difference only, that it appears, ſince the diſcovery of thoſe parts of Africa and Aſia which were unknown to the ancients, that the dromedary is, without compariſon, more numerous and more univerſal than the camel; the laſt being ſeldom found but in Turkey, and in ſome other parts of the Levant. While the dromedary, on the other hand more common than any other beaſt of his ſize, is to be found in all the northern parts of Africa, which extends from the Mediterranean to the Black Sea; in Egypt, in Perſia, in South Tartary, and in all the northern parts of India.

The dromedary, therefore occupies an immenſe tract of land, while the camel is confined to a ſmall ſpot. The firſt inhabits hot and parched regions; the ſecond, a more moiſt and temperate ſoil. The camel appears to be a native of Arabia; for it is not only the country where there is the greateſt number, but it is alſo moſt conformable to them. Arabia is the moſt parched country in the world; and the camel is the leaſt thirſty of all animals. The land is almoſt in every part dry and ſandy; the feet of the camel are formed to travel in ſand; while, on the contrary, he cannot ſupport himſelf in moiſt and ſlippery ground. Herbage is almoſt unknown in this country, as is alſo the ox, whoſe place is ſupplied by the camel.

The Arabs regard the camel as a preſent from heaven, a ſacred animal, without whoſe aid they could neither ſubſiſt, trade, nor travel. The milk of theſe beaſts is their common nouriſhment; they likewiſe eat their fleſh, eſpecially that of the young ones, which they reckon very good. The hair of theſe animals, which is fine and ſoft, is renewed every year, and ſerves them to make ſtuffs for their cloathing and their furniture. Bleſt with their camels, they not only want for nothing, but they even fear nothing. With them they can, in a ſingle day place fifty miles of a deſart between them and their enemies; and all the armies in the world would periſh in the purſuit of a troop of Arabs. Let any one figure to himſelf a country without verdure, and without water, a burning ſun, a ſky always clear, plains covered with ſand, and mountains ſtill more parched, the whole deſtitute of any animal whatever, a dead earth, *flayed* (if I may be allowed the expreſſion) by the winds, which preſents nothing but bones of dead bodies, flints ſcattered here and there, rocks overthrown; a deſart entirely naked, where the traveller never breathed under the hoſpitable ſhade, and where nothing reminds him of living nature. A perfect ſolitude, a thouſand times more frightful than that of the foreſt (for trees appear as beings to the man who, thus deſolate, thus naked, and thus loſt in theſe void and unbounded places, looks over all the extended ſpace as his tomb); an immenſity which he in vain attempts to run over; for hunger, thirſt, and burning heat, preſs on him every diſtracted moment that remains between deſpair and death.

Nevertheleſs, the Arab has found means to ſurmount theſe difficulties, and even to appropriate to himſelf theſe gaps of Nature. They ſerve him for an aſylum, and conſtitute his independence.—But why does not man know how to make uſe of them without abuſe? This ſame Arab, free, independent, tranquil, and even rich, inſtead of reſpecting theſe deſarts as the ramparts of his liberty, ſoils them with guilt. He traverſes over them to the neighbouring nations, and robs them of their ſlaves and gold. He renders them ſubſervient to his robberies, which, unfortunately, he enjoys more than his liberty; for his enterprizes are almoſt always ſucceſsful. Notwithſtanding the caution of his neighbours, and the ſuperiority of their forces, he eſcapes their purſuit, and bears off the fruit of his rapine with impunity.

An Arab who deſtines himſelf to this buſineſs of land piracy, early inures himſelf to ſpend many ſleepleſs days; to endure hunger, thirſt, and heat; and at the ſame time he initiates his camels, in the ſame principles. When they are but a few days old, he bends their legs under their bellies, and conſtrains them to remain on the ground, and loads them, in this ſituation, with a weight as heavy as they uſually carry, which he only relieves them from to give them a heavier. Inſtead of ſuffering them to feed at every hour, and drink when they are thirſty, he regulates their repaſts, and, by degrees, increaſes them to greater diſtances between each meal, diminiſhing at the ſame time, the quantity of their food. When they are a little ſtronger, he exerciſes them to the courſe; he excites them by the example of horſes, and endeavours to render them ſwifter, and more robuſt. At length, when he is aſſured of the ſtrength and ſwiftneſs of his camels, and that they can endure hunger and thirſt, he then loads them with whatever is neceſſary for his and their own ſubſiſtence. He departs with them, arrives unexpectedly at the borders of the deſart, ſtops the firſt paſſenger he ſees, pillages the ſtraggling habitations, and loads his camels with his booty. If purſued, and forced to retreat, then he diſplays all his own and his animal's talents. Mounted on one of his ſwifteſt camels, he conducts the troop, makes them travel day and night, almoſt without ſtopping either to eat or to drink. In this manner, he eaſily paſſes over three hundred miles in eight days; and, during all that time of fatigue and travel, he never unloads his camels, and only allows them an hour of repoſe, and a ball of paſte each day. They often run in this manner for eight or nine days without a drop of water; and when by chance they find a pool at ſome diſtance from their route, they ſcent the water at more than half a mile off. Thirſt now makes them redouble their pace; and then they drink enough for all the time paſt, and for as long to come; for often they are many weeks in travelling; and their abſtinence continues as long as their journey.

In Turky, Perſia, Egypt, Arabia, Barbary, &c. they uſe no other carriage for their merchandize than camels, which is, of all their conveyances, the cheapeſt and beſt. Merchants, and other travellers, aſſemble themſelves in caravans, to avoid the inſults and piracies of the Arabs. Theſe caravans are very numerous, and often compoſed of more camels than men. Every one of theſe camels is loaded according to his ſtrength; and he is ſo ſenſible of it himſelf, that when a heavier load than uſual is put upon him, he refuſes it, by conſtantly remaining in his reſting poſture, till part of his burden is removed.

Large and ſtrong camels generally carry 1000, and even 1200 weight; the ſmall only 6 or 700. In theſe commercial journeys, they do not travel quick; and, as the route is often ſeven or eight hundred miles, they regulate their ſtages. They only go ten or twelve miles every day; they are diſburthened every evening, and are ſuffered to feed at liberty. If they are in a part of the country where there is paſture, they eat enough in one hour to ſerve them twenty-four, and to ruminate on during the whole night; but they ſeldom meet with paſtures, and this delicate food is not neceſſary for them. They even ſeem to prefer wormwood, thiſtles, nettles, furze, and other thorny vegetables, to the milder herbs; and ſo long as they can find ſuch plants to brouze on, they very eaſily live without water.

This facility with which they abſtain ſo long from drinking, is not pure habit, but rather an effect of their formation. Independent of the four ſtomachs which are commonly found in ruminating animals, the camel is poſſeſſed of a fifth bag, which ſerves him as a reſervoir for the water. This fifth ſtomach is peculiar to the camel. It is of ſo vaſt a capacity, as to contain a great quantity of liquor, where it remains without corruption, or without the other aliments being able to mix with it. When the animal is preſſed with thirſt, or has occaſion to dilute the dry food, and to macerate it for rumination, he makes a part of this water re-aſcend into the ſtomach, and even to the throat, by a ſimple contraction of the muſcles.

This animal bears about him all the marks of ſlavery and pain; below the breaſt, upon the ſternum, is a thick and large calloſity, as tough as horn. A ſimilar ſubſtance appears upon the joints of the legs; and although theſe calloſities are to be met with in every camel, yet they plainly prove that they are not natural, but produced by an exceſſive conſtraint, and pain, as appears from their being often full of pus. It is therefore evident, that this deformity proceeds from the cuſtom to which theſe animals are conſtrained, of forcing them, when quite young, to lie upon their ſtomach with their legs bent under them, and in that cramped poſture to ſupport not only the weight of their body, but alſo the burdens with which they are loaded. Theſe poor animals muſt ſuffer a great deal, as they make lamentable cries, eſpecially when they are over-loaded; and, notwithſtanding they are continually abuſed, they have as much ſpirit as docility. At the firſt ſign, they bend their legs under their bodies, and, kneeling upon the ground, they are unloaded with the greateſt eaſe, without the trouble of lifting up the load to a great height, which muſt happen, were they to ſtand erect. As ſoon as they are loaded, they raiſe themſelves up again, without any aſſiſtance or ſupport; and the conductor, mounted on one of them, precedes the whole troop, which follow in the ſame pace as he leads. They have neither need of whip nor ſpur to excite them; but, when they begin to be fatigued, their conductors ſupport their ſpirits, or rather charm their wearineſs, by a ſong, or the ſound of ſome inſtrument. When they wiſh to prolong the rout, or double the day's journey, they give him an hour's reſt; after which, renewing their ſong, they again proceed on their way for many hours more, and the ſinging continues until the time that they ſtop. Then the camels again kneel down on the earth, to be relieved from the burden, by the cords being untied, and the bales rolled down on each ſide. They remain in this cramped poſture, with their belly couching upon the earth, and ſleep in the midſt of their baggage, which is tied on again next morning with as much readineſs as it was untied before they went to reſt. Theſe are, however, not their only inconveniencies: they caſtrate them when young. They leave but one male for eight or ten females; and all the labouring camels are commonly gelt. Theſe are weaker, no doubt, than thoſe which are not caſtrated; but they are more tractable than the others, who are not only indocile, but almoſt furious, in the rutting time, which remains forty days, and which happens every ſpring. The female goes with young exactly a year, and, like all other large animals, produces but one at a birth. They have great plenty of milk, which is thick, and nouriſhing even for the human ſpecies if it is mixed with a more equal quantity of water. The females ſeldom do any labour while they are with young, but are ſuffered to bring forth at liberty. The profit which ariſes from their produce, and from their milk, is perhaps more than what is got from their labour; nevertheleſs, in ſome places, a great part of the females undergo caſtration, as well as the males, in order to render them more fit for labour. In general, the fatter the camels are, the more capable they are of enduring great fatigues Their hunches appear to be formed only from the ſuperabundance of nouriſhment; for, in long journeys, where they are obliged to ſtint them in their food, and where they ſuffer both hunger and thirſt, theſe hunches gradually diminiſh, and are reduced almoſt even. The eminences are then only diſcovered by the height of the hair, which is always much longer upon theſe parts than upon any other part of the back.

The young camel ſucks its dam a year; and when they want to make him ſtrong and robuſt, they leave him at liberty to ſuck or graze for a longer time, nor begin to load him, or put him to labour, till he has attained the age of four years. The camel generally lives forty or fifty years.

The camel is not only of greater value than the elephant, but perhaps not of leſs than the horſe, the aſs, and the ox, all united together. He alone carries as much as two mules; he not only alſo eats leſs, but likewiſe feeds on herbs as coarſe as the aſs. The female furniſhes milk a longer time than the cow. The fleſh of young camels is good and wholeſome, like veal. Their hair is finer, and more ſought after than the fineſt wool; Sal ammoniac is made from their urine; their dung, when dried and powdered, ſerves either themſelves or their horſes for litter. In fine, a kind of turf is alſo made of this dung, which burns freely, and emits a flame as clear, and almoſt as lively, as that of dry wood. Even this is another great uſe, eſpecially in deſarts, where not a tree is to be ſeen, and where, from the deficiency of combuſtible matters, fire is almoſt as ſcarce as water.

The Buffalo, the Aurochs, the Biſon, and the Zebu.

Although the Buffalo is, at preſent common in Greece, and tame in Italy, it was neither known by the Greeks or Romans; for it never had a name in the language of theſe people. The word *buffalo* even indicates a ſtrange origin, not to be derived either from the Greek or Latin tongues. In fact, this animal is originally a native of the hotteſt countries of Africa and India, and was not tranſported and naturalized in Italy, till towards the ſeventh century. It is true, the ancients have ſpoken of an animal, as of a different ſpecies from the ox, under the name of *bubalus;* and Ariſtotle has called the wild ox of Pæonia, *bonaſus*. Both the ancients and moderns, however, have multiplied the ſpecies needleſsly; and, from attentive obſervation, I am clearly of opinion, that there are but two ſpecies which are eſſentially different, viz. the ox, and the buffalo.

We may obſerve, throughout the different regions of the world, the breed of oxen differing from each other in all external appearances, according to the nature of the climate, or other circumſtances; but the moſt remarkable difference is that which divides them into two claſſes, viz. the *aurochs*, or ox without a hunch on its back, and the *biſon*, or hunched ox. From indubitable facts, however, we are authorized to conclude, that theſe are no other than varieties of the ſame ſpecies. The hunch, the length and quality of the hair, and the form of the horns, are the ſole characters by which the biſon is diſtinguiſhed from the aurochs. But the hunched oxen copulate and produce with our oxen; and we likewiſe know, that the length and quality of the hair, in all animals, depends on the nature of the climate. Beſides we may remark that, in oxen, goats, and ſheep, the form of the horns is various and fluctuating. Theſe differences, therefore, do not ſuffice to eſtabliſh two diſtinct ſpecies; and, ſince our tame ox of Europe copulates with the hunched ox of India, we have the greateſt reaſon to believe that it would alſo copulate with the biſon, or hunched ox of Europe. Notwithſtanding this, however, we need not be ſurpriſed, that the two kinds have not melted or coaleſced into a mungrel breed, ſince many circumſtances may have occurred to keep them aſunder. Beſides, we actually find that theſe kinds have ſubſiſted till this preſent time, either in a free and wild, or in a tame ſtate; and are ſcattered, or rather have been tranſported into all the climates of the earth. All the tame oxen without hunches have proceeded from the aurochs, and all with hunches from the biſon. In order to give a juſt idea of the varieties, we ſhall make a ſhort enumeration of theſe animals, as they are found to be in the different parts of the earth.

To begin with the north of Europe, the few oxen and cows which ſubſiſt in Iceland are deſtitute of horns, although they are of the ſame kind as our oxen. The ſize of theſe animals is rather relative to the plenty and quality of the paſture, than to the nature of the climate.

The Dutch have often brought lean cows from Denmark, which fatten prodigiouſly in their meadows, and which give plenty of milk. Theſe Denmark cows are longer than ours. The oxen and cows of Ukrain, where there is excellent paſture, are ſaid to be the largeſt in Europe: but they are of the ſame kind with our oxen.

The breed of aurochs, or ox without a hunch, inhabits the cold and temperate zones. It is not very much diſperſed towards the ſouthern countries. On the contrary, the breed of the biſon, or hunched ox, fills all the ſouthern provinces. In the whole continent of India; in the Iſlands of the South Seas; and in all Africa, from Mount Atlas to the Cape of Good Hope, we find almoſt nothing but hunched oxen; and it appears, that this breed, which has prevailed in all the hot countries, has many advantages over the others. Theſe hunched oxen, like the biſon, from which they are ſprung, have the hair much ſofter, and more gloſſy than our oxen, which like the auroch, are furniſhed but with little hair, which is of a harſh nature. Theſe hunched oxen are alſo ſwifter, and more proper to ſupply the place of a horſe; and at the ſame time they have a leſs brutal nature, and are not ſo clumſy and ſtupid as our oxen: they are more tractable, and ſenſible which way you would lead them; they are alſo treated with more tenderneſs in their country, than the fineſt horſes are in ours. The regard the Indians have for theſe animals is ſo great, as to have almoſt degenerated into ſuperſtition, the laſt mark of blind reſpect. The ox, as the moſt uſeful animal, has appeared to them to be the moſt worthy of being revered. Upon this account they have made an idol of the oject of their veneration.

Theſe hunched oxen, perhaps, vary again more than ours, in the colours of the hair, and the figure of the horns. The handſomeſt are all white, like the oxen of Lombardy; there are alſo ſome that are deſtitute of horns; there are others that have them very much elevated, and others ſo bent down, that they are almoſt pendant. It even appears, that we muſt divide this firſt kind of biſons, or hunched oxen, into two ſecondary kinds; the one very large, and the other very ſmall: this laſt is that of the *zebu*. Both of them are found nearly in the ſame climates; and both are equally mild and eaſy to drive. In ſhort, both have ſoft hair, and a hunch on the back. This hunch does not depend on the conformation of the ſpine, nor on the bones of the ſhoulder. It is nothing but an excreſcence, which is as palatable as the tongue of an ox. The wens of ſome oxen weigh about forty or fifty pounds; others have them much ſmaller; ſome of theſe oxen have alſo prodigious horns for their ſize. There is one in the French King's cabinet, which is three feet and an half long, and ſeven inches in diameter at the baſe. Many travellers affirm, that they have ſeen them capacious enough to contain fifteen, and even twenty pints of water.

Thus all the ſouthern parts of Africa and Aſia are inhabited with hunched oxen, or biſons, among which a great variety is to be met with in reſpect to ſize, colour, ſhape of the horns, &c. On the contrary, all the northern countries of theſe two parts of the world, and Europe entirely, comprehending even the adjacent iſlands, to the Azores, are only inhabited by oxen without a hunch, that derive their origin from the aurochs. The biſon, or wild hunched ox, is ſtronger, and much larger than the tame ox of India. It is alſo ſometimes ſmaller; but that depends only on the quantity of food. At Malabar, at Abyſſinia, at Madagaſcar, where the meadows are naturally ſpacious and fertile, the biſons are of a prodigious ſize. In Africa and Arabia Petræa, where the land is dry, the zebus, or biſons are ſmalleſt.

Every part of South America is inhabited by oxen without hunches, which the Spaniards, and other Europeans, have ſucceſsfully tranſported. Theſe oxen are multiplied, and are only become leſs in theſe new countries In all the northern parts, as far as Florida, Louiſiana, and even as far as Mexico, the biſons, or hunched oxen, are found in great numbers. Theſe biſons, which formerly inhabited the woods of Germany, Scotland, and other northern countries, have probably paſſed from the one continent to the other, and are become, like other animals, ſmaller in this new world; and as they are habituated to climates more or leſs cold, they have preſerved their coat more or leſs warm. Their beard is longer at Hudſon's Bay than at Mexico; and, in general, this hair is ſofter than the fineſt wool.

Thus the wild and the tame ox, the European, the Aſian, the American, and the African ox, the bonaſus, the aurochs, the biſon, and the zebu, are all animals of one and the ſame ſpecies, which according to the climates, food, and different uſage they have met with, have undergone all the variations we have already explained. The ox, as the moſt uſeful animal, is alſo the moſt univerſally diſperſed. He appears ancient in every climate, tame among civilized nations, and wild in deſert or unpoliſhed countries. He ſupports himſelf by his own ſtrength when in a ſtate of nature, and has never loſt the qualities relative to the ſervice of man. The young wild calves which are taken from their mothers in India and Africa, have, in a ſhort time, become as tractable as thoſe which are the progeny of the tame kind; and this natural conformity is another ſtriking proof of the identity of the ſpecies.

If it be aſked, whether the aurochs or the biſon, claims the firſt place? it appears to me, that a ſatisfactory anſwer may be drawn from the facts we have juſt ſpecified. The hunch or wen of the biſon is probably no other than an accidental character, which is effaced in the mixture of the two kinds. The aurochs, or ox without an hunch, then, is the moſt powerful and predominant of the two; for, if it was the contrary, the hunch, inſtead of diſappearing, would extend and remain upon every one of this mixed breed. What confirms and proves ſtill more the indentity of the ſpecies of biſon and aurochs, is, that the biſons, or hunch-backed oxen, in the north of America, have ſo ſtrong a ſmell, that they have been called *muſk oxen* by the greateſt number of travelliers; and, at the ſame time, we learn that the aurochs, or wild ox of Pruſſia and Livonia, has the ſmell of muſk, like the biſon of America.

There remain, therefore, but two ſpecies, the buffalo and ox, out of all the names placed at the head of this chapter; to each of which the ancient and modern naturaliſts have given a ſeparate and diſtinct ſpecies. Theſe two animals, although they are very like each other, and often live under the ſame roof, and feed in the ſame meadow, yet, they have ever refuſed to copulate with one another. Their nature is more diſtant than that of the aſs is from the horſe. There even appears to be a ſtrong antipathy between them; for it is affirmed, that cows will not ſuckle the young buffaloes; and the female buffalo refuſes the ſame kindneſs to other's calves. The buffalo is of a more obſtinate nature, and leſs tractable than the ox. He obeys with greater reluctance, and his temper is more coarſe and brutal. Like the hog, he is one of the filthieſt of all tame animals, as he ſhews by his unwillingneſs to be cleaned and dreſſed. His figure is very clumſy, and forbidding: his look ſtupidly wild: he carries his tail in an ignoble manner, and his head in a very bad poſture, almoſt always inclined towards the ground. His voice is a hideous bellowing, with a tone much ſtronger, and more hoarſe than that of the bull: his legs are thin, his tail bare, and his phyſiognomy dark, like his hair and ſkin. He differs externally from the ox, cheifly in the colour of his hide, which is eaſily perceived under the hair, with which he is but ſparingly furniſhed: his body is likewiſe thicker and ſhorter than that of the ox: the legs are longer, and proportionably much leſs: the horns are not ſo round, black, and partly compreſſed, with a tuft of hair frizzled over his forehead: his hide is likewiſe thicker and harder than that of the ox: his fleſh is black and hard, and not only diſagreeable to the taſte, but to the ſmell: the milk of the female is not ſo good as that of the cow; nevertheleſs, ſhe yields a greater quantity. In hot countries, almoſt all the cheeſe is made of buffaloes milk. The fleſh of the young buffaloes, though killed during the ſuckling time, is not good. The hide alone is of more value than all the reſt of the beaſt, whoſe tongue is the only part that is proper to eat. This hide is firm, light, and almoſt impenetrable. As theſe animals, in general, are larger and ſtronger than the oxen, they are very ſerviceable in the plough: they draw well, but do not carry burdens: they are led by the means of a ring paſſed through their noſe. Two buffaloes harneſſed, or rather chained to a waggon, will draw as much as four ſtrong horſes. As they carry their tails and their heads naturally downwards, they employ the whole force of their body in drawing; and this heavy maſs greatly exceeds that of a horſe or a labouring ox.

The form and thickneſs of the buffalo alone are ſufficient to indicate that he is a native of the hotteſt countries. The largeſt quadrupeds belong to the torrid zone in the Old Continent; and the buffalo, for his ſize and thickneſs, ought to be claſſed with the elephant, the rhinoceros, and the hippopotamus. The camel is more elevated, but ſlenderer, and alſo an inhabitant of the ſouthern countries of Africa and Aſia. Notwithſtanding this, the buffaloes live and multiply in Italy, in France, and in other temperate provinces. Thoſe that are in the French King's menagerie, have brought forth two or three times. The female has but one at a time, and goes about twelve months; which is another proof of the difference between this ſpecies and that of the cow, which only goes nine months. It appears alſo that theſe animals are gentler in their native country; and the hotter the climate is, the more tractable is their nature. In Egypt they are more ſo than in Italy; and in India they are more ſo than in Egypt. Thoſe of Italy have alſo more hair than thoſe of Egypt, and thoſe of Egypt more than thoſe of India. Their coat is never entirely covered, becauſe they are natives of hot countries; and, in general, large animals of this climate have either no hair, or elſe very little.

There are a great number of wild buffaloes in the countries of Africa and India, which are watered with many rivers, and furniſhed with large meadows. Theſe wild buffaloes go in droves, and make great havock in cultivated lands; but they never attack the human ſpecies, and will not run at them, unleſs they are wounded. At this time they are very dangerous; for they make directly at their enemy, throw him down, and trample him to death under their feet; they are greatly terrified, however, at the ſight of fire, and are diſpleaſed at a red colour.

The buffalo, like all other animals of warm climates, is fond of bathing, and even of remaining in the water: he ſwims very well, and boldly traverſes the moſt rapid flood. As his legs are longer than thoſe of the ox, he runs alſo quicker upon land. The Negroes in Guinea, and the Indians in Malabar, where the wild buffaloes are very numerous, often hunt them. They neither purſue them nor attack them openly, but, climbing up the trees, or hiding themſelves in the woods, they wait for them, and kill them; the buffaloes not being able, without much trouble, to penetrate theſe foreſts, on account of the thickneſs of their bodies, and the incumberance of their horns. Theſe people are fond of the fleſh of the buffalo, and make great profit by vending their hides and their horns, which are harder and better than thoſe of the ox. The animal that is called in Congo *empacapa*, or *pacapa*, though very ill deſcribed by travellers, ſeems to me to be the buffalo. That too which they have ſpoken of, under the name of *empabunga*, or *impalunca*, in the ſame country, is probably the bubalus.

CHAP. XVII.

OF THE MUFFLON, AND OTHER SHEEP—THE AXIS—THE TAPIR—THE ZEBRA—THE HIPPOPOTAMUS—THE ELK, AND REIN DEER.

The Mufflon, and other Sheep.

THE breed of ſheep, though perhaps originally all of the ſame ſpecies, yet are found to be very different in different countries. Our domeſtic ſheep is only to be met with in Europe, and in ſome of the moſt temperate provinces in Aſia, and if tranſported into Guinea, loſes its wool, and is covered with hair. It increaſes there but little, and its fleſh has no longer the ſame taſte. It cannot ſubſiſt in cold countries; but even in thoſe, and in Iceland, a breed of ſheep is to be found, with many horns, ſhort tails, harſh and thick wool, under which, as in almoſt every animal in the north, is a ſecond lining, of a ſofter, finer, and thicker wool. In warm climates, ſome are covered with wool, others with hair, and a third kind with hair mixed with wool. The firſt kind of thoſe countries, is that commonly called the Barbary or Arabian ſheep, which entirely reſembles the tame kind, except the tail, which is very much loaded with fat, is often more than a foot broad, and weighs upwards of twenty pounds. In external appearance, this ſheep has nothing remarkable, but the tail, which he carries as if a pillow was faſtened to his hinder parts. Among this kind of broad-tailed ſheep, there are ſome whoſe tails are ſo long and heavy, that the ſhepherds are obliged to faſten a ſmall board, and wheels to them, in order to ſupport it as they walk along. In the Levant, theſe ſheep are clothed with a very fine wool. In the hotter countries, as

Madagaſcar, and Eaſt India, they are cloathed with hair. The ſuperabundance of fat, which in our ſheep fixes upon the reins, in theſe deſcends under the vertebræ of the tail; but the other parts of the body are leſs charged with it than in our fat ſheep. This variety is to be attributed to the climate, the food, and the care of mankind; for theſe broad, or long tailed ſheep, are tame, like thoſe of our country; and they require much more care and management. This breed is much more diſperſed than ours; they are commonly met with in Turkey, Perſia, Syria, Egypt, Barbary, Ethiopia, and Madagaſcar; and even as far as the Cape of Good Hope.

In the iſlands of the Archipelago, and chiefly in the iſland of Candia, there is a breed of ſheep which Bellon has given the figure and deſcription of, under the name of *ſtrepſicheros*. This ſheep is of the make of our common ſheep: it is, like it too, clothed with wool, and only differs from it by the horns, which are ſtraight, and in ſpiral furrows.

In ſhort, in the hotteſt countries of Africa and India, there is a breed of large ſheep, which has rough hair, ſhort horns, hanging ears, and a kind of tuft under the tail. Leon Africanus, and Marmol, call it *adamain;* and it is known to the naturaliſts by the names of the *Senegal ram*, the *Guinea ram*, and the *Angola ſheep*, &c. He is tame like ours, and, like him, ſubject to variety. Theſe, though different in themſelves by particular characters, reſemble each other ſo much in other reſpects, that we can ſcarcely doubt but they are of the ſame kind.

In conſidering, therefore, according to the difference of climate, the ſheep which are purely tame, we find,

1. The ſheep of the north, who have many horns, and whoſe wool is rough and very thick; and the ſheep of the iſland of Goathland, Muſcovy, and many other parts of the north of Europe, whoſe wool is thick, and which appear to be of the ſame breed.

2. Our ſheep, whoſe wool is very good and fine in the mild climates of Spain and Perſia, but in hot countries changes to a rough hair.

3. The broad-tailed ſheep, whoſe wool is very fine in temperate countries, ſuch as Perſia, Syria, and Egypt; but which, in hot countries changes into a hair more or leſs rough.

4. The ſheep *ſtrepſicheros*, or Cretan ſheep that reſemble ours both in wool and make, except the horns, which are ſtraight and furrowed.

5. The *adimain*, or the great ſheep of Senegal and India, is entirely clothed with hair, which is longer or ſhorter, rougher or ſmoother, according to the heat of the climate. All theſe ſheep are only varieties of one and the ſame ſpecies, and certainly would copulate one with the other; for we are certain that the goat, whoſe ſpecies is farther diſtant, copulates with our ſheep. But none of theſe tame ſheep have the characters of an original ſpecies. In the mountains of Greece, in the iſlands of Cyprus, Sardina, Corſica, and in the deſarts of Tartary, the animal which we call the *muſſlon*, is ſtill to be found. It appears to us, to be the primitive ſtock of all ſheep. He lives in a ſtate of nature, and ſubſiſts and multiplies without the help of man; he reſembles the ſeveral kinds of tame ſheep, more than any other animal. He is livelier, ſtronger, and ſwifter than they are. His head, forehead, eyes, and face, are like thoſe of the ram, which he not only reſembles in the form of the horns, but in the whole habit of body. In ſhort, he copulates

pulates with the tame ſheep, which alone is ſufficient to demonſtrate, that he is of the ſame ſpecies, and the primitive ſtock of the different breeds.

The only difference betwixt the mufflon and our ſheep is, that the firſt is covered with hair inſtead of wool; but we have obſerved, that, even in tame ſheep, the wool is not an eſſential character, but a production of a temperate climate. Hence, it is not aſtoniſhing, that the original, or primitive and wild ſheep, who has endured cold and heat, lived and increaſed, without ſhelter, in the woods, is not covered with wool, which he would ſoon be robbed of by the thickets and thorny buſhes. Beſides, when a he-goat is coupled with a tame ſheep, the production is a lamb covered with hair, which returns to the original ſpecies, and which appears to indicate, that our goats, and tame ſheep, have ſomething common to them both in their origin.

The Axis.

This animal being only known by the vague names of the *hind* of *Sardinia*, and the *deer* of the *Ganges*, we have thought it neceſſary to preſerve the name which Bellon has given to him, and which he borrowed from Pliny. The axis is of the ſmall number of ruminating animals that wear horns, like the ſtag. He has the ſhape and ſwiftneſs of the fallow-deer; but what diſtinguiſhes him from the ſtag, and fallow-deer, is, that his body is marked with white ſpots, elegantly diſpoſed, and ſeparated one from another, and that he is a native of hot countries: the ſtag and the deer on the other hand, have their coat of an uniform colour, and are to be met with in greater numbers, in cold countries and temperate regions, than in hot climates.

The gentlemen of the Academy of Sciences have only given him the name of the *Sardinian hind*, becauſe, very probably, they received that name from the royal menagerie; but there is nothing indicated of this animal being a native of Sardinia. No author has ever mentioned, that he exiſts in that iſland like a wild animal; but, on the contrary, we are told, that he is found in the hotteſt countries of Aſia.

We have already remarked, that there is no ſpecies which approaches ſo near to another, as that of the deer to the ſtag. Notwithſtanding this the axis appears to be an intermediate mixture between the two. He reſembles the deer in the ſize of his body, length of his tail, and his coat, which is the ſame during his whole life. He can hardly be ſaid to differ from that animal in any thing but in his horns, which nearly reſemble thoſe of the ſtag. The axis, therefore, may poſſible be only a variety depending on the climate, and not a different ſpecies from the deer; for, although he is a native of the hotteſt countries of Aſia, he thrives well enough in Europe. There are many herds of them in the menagerie of Verſailles; but it has never been obſerved, that they mix either with the deer or with the ſtags. Hence we preſume, that it was not a variety of one or the other, but a particular and mediate ſpecies between the two.

The Tapir, or the Anta.

The Tapir, or the Anta, is the largeſt animal in America, where, as we have ſaid, living Nature ſeems to be leſſened, or rather has not had time to arrive at its greateſt dimenſions. The animals alſo of South America, which alone properly and originally belong to this New Continent, are almoſt without defence, without horns, and without

out tails. Their bodies and their limbs are unproportioned; and ſome, as the ſluggiſh and crawling animals, &c. are of ſo miſerable a nature, that they ſcarcely have the faculties of moving or of eating. They drag on with pain, a languiſhing life, in the ſolitude of a deſert, and cannot ſubſiſt in the inhabited world, where man and powerful animals would ſoon have deſtroyed them.

The tapir is of the ſize of a ſmall cow, or zebu, but without horns, and without a tail; the legs are ſhort; the body crooked, like that of the hog. In his youth, he wears a coat like that of the ſtag, and afterwards, uniform ſpots, of a dark brown colour: his head is thick and long, with a kind of trunk, like the rhinoceros: he has ten inciſive teeth, and ten grinders, in each jaw; a character which entirely ſeparates him from the ox, and other ruminating animals.

The tapir appears to be a dull and dark animal, that never ſtirs out but in the night, and delights in the water, where he oftener lives than upon land. He is chiefly to be found in marſhes, and ſeldom goes far from the borders of rivers or lakes. When he is threatned, purſued, or wounded, he plunges into the water, and remains there till he has got to a diſtance before he makes his ſecond appearance. Theſe cuſtoms, which he has in common with the hippopotamus, have made ſome naturaliſts imagine him to be of the ſame ſpecies; but he differs as much from him in nature, as he is diſtant from him in climate. To be aſſured of this, we need only compare their deſcriptions with thoſe we have given of the hippopotamus. Notwithſtanding the tapir inhabits the water, he does not feed upon fiſh; and, although his mouth is armed with twenty ſharp and inciſive teeth, he is not carnivorous. He lives upon plants and roots, and does not make uſe of what Nature has armed him with againſt other animals. He is of a mild and timid nature, and flies from every attack or danger. His legs are ſhort, and his body maſſive; notwithſtanding which, he runs very ſwift, and ſwims ſtill better than he runs. He is generally found in company, and ſometimes in droves. His fleſh is of a very firm texture, and often reſiſts a bullet; and though it be coarſe and inſipid, the Indians eat it. This animal is commonly found in Braſil, Paraguay, Guiana, and in all the extent of South America, from the extremity of Chilo to New Spain.

The Zebra.

The zebra is perhaps the handſomeſt, and moſt elegantly clothed of all quadrupeds. He has the ſhape and the graces of the horſe, the ſwiftneſs of the ſtag, and a ſtriped robe of black and white, alternately diſpoſed, with ſo much ſymmetry, that it ſeems as if Nature had made uſe of the rule and compaſs to paint it. Theſe alternate bands of black and white, are ſo much the more ſingular, as they are ſtraight, parallel, and very exactly divided, like a ſtriped ſtuff; and as they, in other parts, extend not only over the body, but over the head, the thighs, the legs, and even the ears and the tail. Hence, this animal at a diſtance appears as if he was ſurrounded with little fillets, which ſome perſon had diſpoſed, in a regular manner, over every part of the body. In the females, theſe bands are alternately black and white. In the male, they are black and yellow, but always of a lively and brilliant mixture, upon a ſhort, fine, and thick hair, the luſtre of which adds to the embelliſhment of the colours. The zebra is, in general, leſs than the horſe, and larger than the aſs; and, although it has often been compared to thoſe two animals, and called the *wild horſe*, and the *ſtriped aſs*, it is a copy neither of the one nor the other, but might rather be called their model, if every ſpecies had not an equal right to creation.

The zebra is not the animal the ancients have denominated *onagra*. There exiſts in the Levant, the eaſtern parts of Aſia, and in the northern parts of Africa, a beautiful race of aſſes, that like the fineſt horſes, are natives of Arabia. This race differs from the common, by the ſize of the body, the ſlenderneſs of the legs, and the luſtre of the hair. They are of an uniform, but commonly of a fine mouſe colour, with a black croſs upon the back and the ſhoulders; and ſometimes they are a bright grey, with a flaxen croſs. The zebra is alſo of a different climate from the onagra, and is only to be met with in the moſt eaſtern and moſt ſouthern parts of Africa, from Ethiopia to the Cape of Good Hope, and thence to Congo. It exiſts neither in Europe, Aſia, nor America, nor even in all the northern parts of Africa. Thoſe which ſome travellers tell us they have ſeen at the Braſils, have been tranſported thither from Africa. Thoſe which others are ſaid to have ſeen in Perſia, and in Turkey, have been brought from Ethiopia; and, in ſhort, thoſe that we have ſeen in Europe, are almoſt all from the Cape of Good Hope. This point of Africa is their true climate, their native country, and where the Dutch have employed all their cares to ſubject them, and to render them tame, without having been hitherto able to ſucceed. That which we have ſeen, and which has ſerved for the ſubject of our deſcription, was very wild when he arrived at the royal menagerie in France; and he was never entirely tamed. Notwithſtanding this, he has been broken for the ſaddle; but two men had to hold the bridle, while a third was upon him. His mouth is very hard; and his ears are ſo ſenſible, that he winces whenever any perſon is about to touch him. He was reſtleſs as a vicious horſe, and obſtinate as a mule; but perhaps the wild horſe, and the onagra, are not leſs intractable. And there is reaſon to believe, that, if the zebra was accuſtomed to obedience and tameneſs, from his earlieſt years, he would become as mild as the aſs or horſe, and might be ſubſtituted in their room.

The Hippopotamus.

Although this animal has been celebrated from the earlieſt ages, it was, notwithſtanding, but imperfectly known to the ancients. It is only towards the ſixteenth century, that we have been able to procure any accurate information on the ſubject.

In comparing the relations of different travellers, the hippopotamus appears to be an animal whoſe body is longer and thicker than that of the rhinoceros; but his fore legs are much ſhorter. His head is ſhort and thick in proportion to the body. He has no horns, neither on the noſe like the rhinoceros, nor on the head like ruminating animals. His cry, when hurt, approaches as near to the neighing of a horſe, as to the bellowing of the buffalo. His uſual voice, however, reſembles the neighing of a horſe, from which, he differs in every other reſpect; and this fact, we may preſume, has been the ſole reaſon for giving him the name of *hippopotamus*, which ſignifies a *river-horſe;* as the howling of the lynx, which reſembles that of the wolf, has occaſioned him to be called the *ſtag-like wolf*. The inciſive teeth of the hippopotamus, and eſpecially the two canine teeth of the lower jaw, are very long, very ſtrong, and of ſo hard a ſubſtance, that they ſtrike fire with a piece of iron. This is probably what has given riſe to the fable of the ancients, who have reported that the hippopotamus vomited fire. Theſe canine teeth of this animal are ſo white, ſo clean, and ſo hard, that they are preferable to ivory, for making artificial teeth. The inciſive teeth of the hippopotamus, eſpecially thoſe of the lower jaw, are very long, cylindrical, and furrowed. The canine teeth, which are alſo very long, are crooked, priſmatic and ſharp, like the tuſks of a boar. The molares are ſquare, or rather longer on one ſide than the other, nearly like the grinders of a man, and ſo thick, that a ſingle one weighs more than three pounds. The largeſt of the inciſive, or canine teeth, are twelve, and even ſixteen inches long, and ſometimes weigh twelve or thirteen pounds each.

The male hippopotamus is about ſix feet nine inches long, from the extremity of the muzzle to the beginning of the tail. They are fifteen feet in circumference, and ſix feet and a half high. His legs are about two feet ten inches long; the length of the head, three feet and an half, and eight feet and an half in circumference: the width of the mouth is two feet four inches; and the large teeth are above a foot long.

Thus powerfully armed, with a prodigious ſtrength of body, he might render himſelf formidable to every animal; but he is naturally gentle, and is at the ſame time ſo heavy and ſlow, that he cannot poſſibly catch any other quadruped in the chace. He ſwims quicker than he runs, purſues the fiſh and makes them his prey. He delights much in the water, and ſtays there as willingly as upon land; notwithſtanding which, he has no membranes between his toes like the beaver and otter. Hence it is evident that the great eaſe with which he ſwims, is only owing to the great capacity of his body, which is nearly of an equal weight with the water. Beſides, he remains a long time under water, and walks at the bottom as well as he does in the open air. When he quits it to graze upon land, he eats ſugar-canes, ruſhes, millet, rice, roots, &c. of which he conſumes and deſtroys a great quantity; but, as he is more timid upon earth than in the water, he is very eaſily driven away; and, as his legs are ſhort, he cannot ſave himſelf well by flight, if he is far from the water. His reſource, when he finds himſelf in danger, is to plunge himſelf into the water, and not to appear till he be at a great diſtance. He generally retreats from his purſuers; but if he is wounded, he becomes irritated, and, immediatly facing about with great fury, ruſhes againſt the boats, ſeizes them with his teeth, often tears pieces out of them, and ſometimes ſinks them under water. "I have ſeen," ſays a traveller, "an hippopotamus open his mouth, fix one tooth on the ſide of a boat, and another to the ſecond plank under the keel; that is, four feet diſtant from each other, pierce the ſide through and through, and ſink the boat to the bottom. I have ſeen another, lying by the ſide of the ſea-ſhore, upon which the waves had driven a ſhallop heavily loaded, which remained upon his back dry, and which was again waſhed back by another wave, without the animal appearing to have received the leaſt injury. When the Negroes go to fiſh in their canoes, and meet with an hippopotamus, they throw fiſh to him, which makes him paſs without giving them any farther diſturbance. He injures moſt when he can reſt himſelf againſt the earth; but when he floats in the water, he can only bite. Once, when our ſhallop was near ſhore, I ſaw one of them get below it, lift it above water upon his back, and overſet it, with ſix men who were in it; but who fortunately received no hurt."

"We dare not," ſays another traveller, "irritate the hippopotamus in the water, ſince an adventure happened, which was likely to prove fatal to three men. They ſet out in a ſmall canoe, to kill one in a river where the water was about eight or ten feet deep. After they had diſcovered him walking at the bottom, according to his cuſtom, they wounded him with a long lance, which enraged him ſo much, that he roſe immediately to the ſurface of the water, ſtared at them with a terrible look, opened his mouth, and, at one bite, took a great piece out of the ſide of the canoe, and had very nearly overturned it; but he replunged, almoſt inſtantaneouſly, to the bottom of the water."

Theſe animals are only numerous in ſome parts of the world. It even appears, that the ſpecies is confined to particular climates, and ſeldom to be met with but in the rivers of Africa. Dutch travellers ſay, that they bear three or four young ones; but this appears to me very ſuſpicious. As the hippopotamus is of an enormous bulk, he is in the claſs of the elephant, the rhinoceros, the whale, and all other great animals, that bring forth but one at a time; and this analogy appears to be more certain than all the teſtimonies that they have given.

The Elk and the Rein-Deer.

Although the elk and the rein-deer are two animals of different ſpecies, we have thought proper to unite them, becauſe it is ſcarcely poſſible to write the hiſtory of the one, without borrowing a great deal from the other.

It appears, by poſitive teſtimonies, that the rein-deer formerly exiſted in France, at leaſt in the high mountains, ſuch as the Pyrenean, and, ſince that time, he has been deſtroyed like the ſtags, that were formerly common in this country. It is certain, that the rein-deer is now actually to be found only in the moſt northern countries. We alſo know, that the climate of France was formerly much more damp and cold, occaſioned by the number of woods and moraſſes, which are no longer to be ſeen. Gaul, under the ſame latitude as Canada, was, two thouſand years ago, what Canada is at this preſent time; a climate cold enough for theſe animals to live in.

The elk and the rein-deer, therefore are only found in the northern countries: the elk on this, and the rein-deer on the other ſide of the polar circle in Europe and in Aſia. We find them in America in the higheſt latitudes, becauſe the cold is greater there than in Europe. The rein-deer can bear even the moſt exceſſive cold. He is found in Spitſbergen; he is common in Greenland, and in the moſt northern parts of Lapland. Hence, in the moſt northern parts of Aſia, the elk does not approach ſo near the pole. He inhabits Norway, Sweden, Polonia, Ruſſia, and all the provinces of Siberia and Tartary, with the north of China. We again find him by the name of *orignal*, and the rein-deer under that of *caribou*, in Canada, and in all the northern parts of America.

We may form a juſt enough idea of the elk and the rein-deer, by comparing them with the ſtag. The elk is larger, thicker, and ſtands more erect upon his legs. His neck is ſhorter, his hair longer, and his antlers wider and heavier than thoſe of the ſtag. The rein-deer is ſhorter and more ſquat: his legs are ſmaller and thicker, and his feet wider: the hair very thickly furniſhed, and his antlers much longer, and divided into a greater number of branches, with flat terminations; while thoſe of the elk are only (if I may uſe the expreſſion) cut or broached at the edges. Both have long hair under the neck, and both have ſhort tails, and ears much longer than the ſtag. They do not leap or bound like the roe-bucks; but their pace is a kind of trot, ſo eaſy and quick, that they go over almoſt as much ground, in the ſame time as the ſtags do, without being ſo much fatigued; for they can trot in this manner, for a day or two. The rein-deer lives upon the mountains: but the ſtag only dwells in low lands and damp foreſts. Both go in herds, like the ſtags, and both can be eaſily tamed, but the rein-deer with greater eaſe than the elk. The laſt, like the ſtag, has not loſt his liberty, while the rein-deer is become domeſtic among the unenlightened part of mankind. The Laplanders have no other beaſt. In the icy climate of Lapland, which only receives the oblique rays of the ſun, where there is a ſeaſon of night as well as of day, where the ſnow covers the earth from the beginning of autumn to the end of ſpring, and where the verdure of the ſummer conſiſts in the bramble, juniper and moſs, could man form any idea but of famine? The horſe, the ox, the ſheep, all our uſeful animals, find no ſubſiſtence there, nor can they reſiſt the rigour of the cold. He has been obliged to ſearch among the inhabitants of the foreſt, for the leaſt wild and moſt profitable animals. The Laplanders have done what we ourſelves ſhould do, if we were to loſe our cattle. We ſhould then be obliged to tame the ſtags and the roe-bucks of the foreſts, to ſupply their place; and I am perſuaded we ſhould render them as ſubſervient to our uſe as the Laplanders do their rein-deer. We ought to be ſenſible, by this example, how far Nature has extended her liberality towards us. We do not make uſe of all the riches which ſhe offers us: the fund is much more immenſe than we imagine it. She has beſtowed on us the horſe, the ox, the ſheep, and all our other domeſtic animals, to ſerve us, to feed us, and to clothe us; and ſhe has, beſides, ſpecies in reſerve, which would be able to ſupply this defect, and which would only require us to ſubject them. Man does not ſufficiently know what Nature can do, nor what can be done with her. Inſtead of ſeeking for what he does not know, he likes better to abuſe her in what he does know.

In comparing the advantages which the Laplanders derive from the tame rein-deer, with thoſe which we derive from our domeſtic animals, we ſhall ſee that this animal is worth two or three of them. He is uſed, as horſes are, to draw ſledges and other carriages: he travels with great ſpeed and ſwiftneſs; he travels thirty miles a day, and runs as well upon frozen ſnow as upon the moſſy down. The female affords milk more ſubſtantial, and more nouriſhing, than that of the cow; the fleſh is very good to eat; his coat makes an excellent fur; and his dreſſed hide becomes very ſupple and durable leather. Thus the rein-deer alone affords all that we derive from the horſe, the ox, and the ſheep.

The antlers of the rein-deer are larger, more extended, and divided into a greater number of branches, than thoſe of the ſtag. His food, in the winter ſeaſon, is a white moſs, which he finds under the ſnow, and which he plows up with his horns, or digs up with his feet.

In ſummer, he lives upon the buds and leaves of trees, rather than on herbs, which his forward-ſpreading antlers will not permit him to brouſe on with eaſe. He runs upon the ſnow, and ſinks but little, on account of his broad feet. Theſe animals are mild; and they bring them up in herds, which turns out greatly to the profit of their keepers. The richeſt Laplanders have herds of four or five hundred head of rein-deer and the poor have only ten or twelve. They lead them to paſture, and lead them back to the ſtable, or ſhut them up in parks during the night, to ſhelter them from the fury of the wolves. If they attempt to change their climate, they die in a ſhort time. Some centuries ago, Steno, prince of Sweden, ſent ſix to Frederick, duke of Holſtein; and, in 1533, Guſtavus, king of Sweden, had ten brought over to Pruſſia, both males and females. All periſhed, without producing any young, either in a domeſtic, or in a free ſtate.

There are both wild and tame rein-deer in Lapland. When the tame females are in rut, they ſometimes let them looſe, to ſeek the wild males; and, as theſe wild males are robuſt, and ſtronger than the tame, thoſe of this mixture are preferred. Theſe rein-deer are not ſo gentle as the others; for they not only ſometimes refuſe to obey thoſe who guide them, but they often turn furiouſly upon them, attack them with their feet, ſo that there is no other reſource than to cover themſelves from their rage by the ſledge, until the fury of the beaſt is ſubſided. This ſledge is ſo light, that they can eaſily manage and cover themſelves with it. The bottom of it is lined with the ſkins of the young rein-deer: the hairy ſide is turned againſt the ſnow, ſo that the ſledge glides eaſily forwards, and recoils leſs on the mountains. The harneſs of the rein-deer is only a thong of the hide, with the hairs remaining on it, round the neck, whence it deſcends towards the breaſt, paſſes under the belly, between the legs, and is faſtened to a hole which is in the fore part of the ſledge. The Laplander has only a ſingle cord with which he guides the animal, and which he throws indifferently upon the back of the beaſt, ſometimes on one ſide, and ſometimes on the other, according as he would direct him to the right or left. They can travel four or five miles an hour; but the quicker this method of travelling is, the more it is inconvenient. A perſon muſt be well accuſtomed to it, and travel often, to be able to direct this ſledge, and prevent it from turning over.

The rein-deers have many things in their external appearance in common with the ſtags: and the formation of the interior part is, if the expreſſion is allowable, the ſame. The rein-deer ſheds his antlers every year like the ſtag, and, like him, is very good veniſon. The females, of both ſpecies, go eight months with young, and produce but one at a birth. The young rein-deer follows her dam during the firſt two or three years, and does not attain his full growth till about the age of four or five. It is at this age, that they begin to dreſs and exerciſe them for labour.

The rein-deers are all very ſpirited, and very difficult to manage; they therefore make uſe of only thoſe which are caſtrated, among which they chuſe the livelieſt and the ſwifteſt to draw their ſledges, and the heavier to travel with their proviſion and baggage at a ſlower pace. Theſe animals are troubled with an inſect, called the gad-fly, during the ſummer ſeaſon, which, burrowing under their ſkins the preceding ſummer, depoſit their eggs. Hence the ſkin of the rein-deer is often ſo full of ſmall holes, that an incurable diſorder is the conſequence.

The herds of this ſpecies require a great deal of care. The rein-deer are ſubject to elope, and voluntarily renew their natural liberty. They muſt be cloſely attended, and narrowly watched. They cannot lead them to paſture but in open places; and, in caſe the herd is numerous, they have need of ſeveral perſons to guard them, and to run after them, if they ſtray. They are all marked, that they may be known again; for it often happens, that they ſtray in the woods, or mix with another herd. In ſhort, the Laplanders are continually occupied in the care of their rein-deer, which conſtitute the whole of their opulence.

The rein-deer is the only animal of this ſpecies the female of which has horns like the male; and the only one alſo which ſheds his horns, and renews them again, notwithſtanding his caſtration. In ſtags, fallow-deer, and roe-bucks, on the contrary, that have undergone this operation, the head of the animals remain always in the ſame ſtate in which it was when caſtrated.

Another ſingularity, which is common to the rein-deer and the elk, is, that when theſe animals run, or quicken their pace, their hoofs, at every ſtep, make a crackling noiſe, as if all the joints of their legs were disjointing. It is the noiſe, or perhaps the ſcent, which informs the wolves of their approach, and, if the wolves are many in number, they very often obtain the victory. The rein-deer is able to defend himſelf againſt a ſingle wolf, not, as may be imagined, with his horns but with his fore-feet, which are very ſtrong, and with which he ſtrikes with ſuch force, as to ſtun the wolf, and to drive him away. After this he flies with ſuch ſpeed, as not to be overtaken. A more dangerous, though a leſs frequent, and leſs numerous enemy than the wolf, is the *roſomack*, or *glutton*. This animal, more voracious, but heavier than the wolf, does not purſue the rein-deer, but climbs and conceals himſelf in a tree, and waits the arrival of his prey. As ſoon as he ſees him within his reach, he ruſhes upon him, and, faſtening himſelf with his nails upon his back, and tearing his head or neck with his teeth, never quits him till he has diſpatched him. He makes the like attack, and uſes the ſame ſtratagems, to conquer the elk, an animal ſtronger than the rein-deer.

The elk and rein-deer are both among the number of ruminating animals.

A tame rein-deer lives only fifteen or ſixteen years; but it is to be preſumed, that the life of the wild rein-deer is much longer. This animal, being four years before he arrives at his full growth, muſt live twenty-eight or thirty years, when he is in his natural ſtate. The Laplanders hunt the wild rein-deers by different methods, according to the difference of ſeaſons. In their rutting time, they make uſe of a tame female to attract the males. They kill them with the muſket, or with the bow and arrow, and bend the bow with ſuch vigour, that, notwithſtanding the thickneſs of the hair, and the firmneſs of the hide, they very often kill one of theſe beaſts with a ſingle arrow.

In general, the elk is a much larger and a much ſtronger animal than the ſtag and the rein-deer. His hair is ſo rough, and his hide ſo hard, that the muſket-ball cannot penetrate it. His legs are very firm, with ſo much motion and ſtrength, eſpecially in the fore feet, that he can kill a man by one ſingle ſtroke of his foot; yet, he is hunted with men and dogs. It is affirmed, that, when he is touched with the lance, or purſued, that he often falls without either being pulled down or wounded. From this circumſtance, it has been conjectured that he is ſubject to the epilepſy, and from this conjecture which is a very abſurd one, a conſequence equally abſurd has been drawn, namely, that his hoof is not only a remedy for, but even an antidote againſt this diſeaſe.

As there are very few people in the northern parts of America, all animals, and particularly elks, abound more there than in the north of Europe. The ſavages are not ignorant of the art of hunting and taking them; they follow them by the track of their feet, very often for many days together; and, by conſtancy and dexterity, they often gain their end. Their method of hunting them in winter is particularly ſingular:—"They make uſe of rackets, or ſnow-ſhoes," ſays Denys, "by means of which, they walk upon the ſnow without ſinking in. The *orignal* does not cover a deal of ground, becauſe of his ſinking in the ſnow, which greatly fatigues him; he eats nothing but the young ſhoots of the trees during the whole year; therefore, where the ſavages find the trees eaten, they preſently meet with the beaſts, which are not far off, and which they approach very eaſily. They throw a dart at them, which is a large club, at the end of which is faſtened a large pointed bone, which pierces like a ſword. If there are many orignals in one troop, they drive them away; for then, the orignals, placing themſelves in a rank, deſcribe a large circle of a mile and a half, or two miles, and ſometimes more. They harden the ſnow ſo much with their feet in turning round, that they no longer ſink in. The ſavages in America wait for their paſſing them, upon which, they diſcharge their darts and diſpatch them."

CHAP. XVII.

OF THE IBEX—THE CHAMOIS, AND OTHER GOATS—THE SAIGA—THE ANTELOPE, OR GAZELLE—OF THE BEZOAR STONE—OF THE BUBALUS, OR STAG-LIKE ANTELOPE—THE CONDOMA, OR STRIPED ANTELOPE—THE GUIB, OR HARNESSED ANTELOPE—THE GRIMM—THE CHEVROTINS—THE MAZAME, AND TEMAMACAME—THE COUDOUS, OR INDIAN ANTELOPE—THE MUSK—THE PRODUCTION OF THAT PERFUME.

The Ibex, the Chamois, and other Goats.

ALTHOUGH it appears, that the Greeks were acquainted with the ibex and the chamois, yet they have not deſcribed them by any particular denominations, nor even by any explicit characteriſtics. They have only pointed them out under the generical name of *wild goats*. They probably preſumed, that theſe animals were of the ſame ſpecies with the domeſtic goats, as they have not given them proper names, as they have done to every other different ſpecies of animals. On the contrary, all our modern naturaliſts have regarded the ibex and the chamois as two real and diſtinct ſpecies, and both different from that of our goats.

The male ibex differs from the chamois, by the length, thickneſs and form of the horns: it is alſo much more bulky, vigorous and ſtrong. The female ibex has horns different from the male: they are alſo much ſmaller, and nearly reſembling thoſe of the chamois. In other reſpects, theſe two animals have the ſame cuſtoms, the ſame manners, and the ſame country. The ibex, as he is endowed with more agility, and is ſtronger than the chamois, climbs to the ſummit of the higheſt mountains; while the chamois only lives in the ſecond ſtage. Neither the one nor the other is to be found in the plains: both make their way on the ſnow: both are covered with a firm and ſolid ſkin, and clothed, in winter, with a double fur of very rough hair, and a finer and thicker hair below. Both of them have a black ſtripe on the back, and both have the tail nearly of the ſame ſize. The number of exterior reſemblances is ſo great, in compariſon with the differences, and the conformity of the exterior parts is ſo complete, that, if we reaſon in conſequence of theſe accounts, we might be induced to believe, that theſe two animals are not really of a different ſpecies, but that they are only conſtant varieties of one and the ſame ſpecies. The ibex, as well as the chamois, when taken young and reared along with domeſtic goats, are eaſily tamed; and, imbibe the ſame manners, herd together, return to the ſtable, and probably copulate together, I own, however, that this fact, the moſt important of all, and which alone would decide the queſtion, is not aſcertained.

Let us, now, take a view of the oppoſite reaſons. The ſpecies of the ibex and the chamois both ſubſiſt in a ſtate of nature, and both are conſtantly diſtinct. The chamois ſometimes comes, of his own accord, and joins the flock of our domeſtic ſheep. The ibex never joins them, at leaſt not before it is tamed. The ibex and the he-goat have a very long beard, and the chamois has none. The male and female chamois have very ſmall horns: thoſe of the male ibex are ſo thick and ſo long, that they would ſcarcely be imagined to belong to an animal of its ſize. The horns of the male ibex are not very different from thoſe of the goat; as the female, however, reſembles our goat, and even the chamois, in the ſize and ſmallneſs of the horns, may we not conclude, that theſe animals, the chamois, and the domeſtic goat, are, in fact, the ſame ſpecies, in which the nature of the females is invariable and alike, while the males are ſubject to varieties, which render them different from one another?

The ibex, or wild goat exactly reſembles the domeſtic goat, in the conformation, the organization, and the natural and phyſical habits. It only varies by two ſlight differences; the one externally, and the other internally. The horns of the ibex are longer than thoſe of the he-goat: they have two longitudinal ridges; and thoſe of the goat have but one: they have alſo thick knots, or traverſe tubercles, by which their age is known, while thoſe of the goats are only marked with tranſverſe ſtrokes. The ibex runs as faſt as the ſtag, and leaps with more agility than the roe-buck. All goats are liable to vertigos, which are common to them with the ibex and the chamois, as well as the inclination to climb up rocks. Beſides they continually lick the ſtones, eſpecially thoſe which are ſtrongly impregnated with ſalt-petre, or common ſalt. In the Alps there are rocks which have been hollowed by the tongue of the chamois. Theſe are generally ſoft and calcinable ſtones, in which, there is always a certain quantity of nitre. Theſe natural agreements, theſe conformable cuſtoms, among other circumſtances, appear to me to be ſufficient demonſtrations of the identity of ſpecies in theſe animals.

The ibex and the chamois, one of which I look upon as the male, and the other as the female ſtock of the goat ſpecies, are only found, like the muſflon, the ſource of the ſheep ſpecies, in deſarts, and upon the moſt craggy places of the higheſt mountains. The Alps, Pyrenees, the mountains of Greece, and thoſe of the iſlands of the Archipelago, are almoſt the only places where the ibex and the chamois are to be found. But, although both theſe animals diſlike heat, and only inhabit the region of ſnow and ice, yet they have alſo an averſion to exceſſive cold. In the ſummer, they chuſe the north of the mountains; in winter, they deſcend into the valleys. Neither can they ſupport themſelves on their legs upon the ice, when it is ſmooth; but, if there be the leaſt inequalities on its ſurface, they bound along with ſecurity.

The chace of theſe animals for which the dogs are quite uſeleſs, is very dangerous to men; for ſometimes the animal, finding itſelf hard puſhed, turns and ſtrikes the huntſman and tumbles him headlong from the rock. The chamois is as ſwift, but not ſo ſtrong as the ibex. The ſpecies of this laſt is more numerous; and they commonly go in herds. There are, however, fewer now than there were formerly, at leaſt in the Alps, and Pyrenean mountains.

Mr Perond, ſurveyor of the cryſtal mines in the Alps, having brought over a living chamois, has given us the following information on the natural habits of this animal:—"The chamois is a wild animal, but eaſily tamed, and very docile. It is about the ſize of a domeſtic goat, and reſembles that animal in many reſpects. It is ſprightly and active beyond expreſſion. Its hair is ſhort, like that of the doe; in ſpring it is of an aſh-colour, and in winter of a blackiſh brown. The large males keep themſelves apart from the reſt, except in their rutting time. The time of their coupling is from the beginning of October to the end of November; and they bring forth in April and March. The young follows the dam for about five months, and ſometimes longer, if the huntſmen, or the wolves, do not ſeparate them. It is aſſerted, that they live between twenty and thirty years. The fleſh of the chamois is palatable; and ſome of the fatteſt afford ten or twelve pounds ſuet, which is far better than that of the goat.

The cry of the chamois is not diſtinctly known. If it has any, it is but faint, and ſomewhat like that of a hoarſe goat; it is by this cry it calls its young; but, when they are frightened, or are in danger of any enemy, or ſome other object not perfectly known to them, they warn the reſt of the flock by a kind of hiſſing noiſe. It is obſervable, that the chamois has a very penetrating eye, and its hearing and ſmell are not leſs acute. When it finds an enemy near, it ſtops, for a moment, and then in an inſtant flies off with the utmoſt ſpeed. When the wind is in its favour, it can ſmell a human creature for more than half a mile diſtant. When this happens, therefore, and it cannot ſee its enemy, but only diſcovers his approach by the ſcent, he begins the hiſſing noiſe with ſuch force, that the rocks and the foreſts re-echo with the ſound. This hiſſing continues as long as the breath will permit. In the beginning it is very ſhrill, but more grave towards the cloſe. The animal then reſts a moment, after this alarm, to inſpect farther into its danger, and, having confirmed the reality of its ſuſpicion, it recommences to hiſs by intervals, till it has ſpread the alarm to a great diſtance. It is then in the moſt violent agitation, ſtrikes the ground forcibly with its fore foot, and ſometimes with both: it bounds from rock to rock: it turns, and looks round: it runs to the edge of the precipice, and when it has obtained a ſight of the enemy, flies from it with all its ſpeed. The hiſſing of the male is much more acute than that of the female: it is performed through the noſtrils, and is, properly, no more than a very ſtrong breath, forced through the noſtrils by fixing the tongue to the palate, keeping the teeth nearly ſhut, the lips open, and a little lengthened. The chamois feeds upon the beſt herbage, and chuſes the moſt delicate parts of plants, flowers, and the moſt tender buds. It is not leſs delicate with regard to ſeveral aromatic herbs, which grow, upon the ſides of the Alps. It drinks but very little, while it feeds upon the ſucculent herbage, and ruminates, like the goat, in the intervals of feeding. Its head is crowned with two ſmall horns, of about half a foot long, of a beautiful black, and riſing from the forehead, almoſt betwixt the eyes. Theſe horns are often uſed for the heads of canes. The hides of theſe animals are very ſtrong and ſupple, and they furniſh ſtuff for good waiſt-coats and and gloves.

The hunting of the chamois is extremely difficult. The moſt uſual way is to hide behind ſome of the rocks, and ſhoot them. The ſportſman is obliged to take great precaution in this buſineſs, and to creep, for a great way, upon his belly, obſerving, at the ſame time, to keep the wind in his face. When he is got within a proper diſtance, and properly ſecured from ſight, he only advances his head and arms, with the piece, from his hiding place, and fires among them. Others hunt this animal, as they do the ſtag, by placing proper perſons at all the paſſages of the glade or valley, and then ſending in others to rouze the game.

The Saiga.

There is a ſort of wild goat found in Hungary, in Tartary, and in South Siberia, which the Ruſſians called *Seigak*, or *Saiga*. It bears a reſemblance to the domeſtic goat, in the ſhape of its body, and in its hair; but, by the ſhape of the horns, and the want of the beard, it approaches nearer the *gazelle*, and appears to be a mixture of theſe two animals.

The ſaiga, by its natural habits, is more like the gazel than the ibex and the chamois; for it does not delight in mountainous countries, but lives upon the hills and plains. It is very agile, very ſwift, and its fleſh has a better reliſh than that of the ibex, or any other wild or tame goat.

The Antelope, or Gazelle.

There have been thirteen ſpecies, or, at leaſt, thirteen very diſtinct varieties, of theſe animals taken notice of. In this uncertainty, in knowing whether they are only varieties, or in fact really different ſpecies, we have thought proper to put them all together, aſſigning to each of them a particular name. The firſt is the common *gazelle*, found in

Syria,

Syria, in Meſopotamia, and in all the provinces of the Levant, as well as in Barbary, and in all the northern parts of Africa. The horns of this animal are about a foot long, entirely annulated at the baſe, which leſſen into half rings towards the extremity; they are not only ſurrounded with theſe rings, but alſo longitudinally furrowed by ſmall ſtreaks. Theſe rings indicate the number of years of their growth, which is commonly about twelve or thirteen. The gazelles in general, and this tribe in particular, greatly reſemble the roe-buck, in the proportions of the body, in its natural functions, in its ſwiftneſs, and in the brightneſs and beauty of its eyes. Theſe reſemblances would incline us to think, that, as the roe buck does not exiſt where the gazelle does, that the roe-buck is only a gazelle, whoſe nature is altered by the influence of the climate, and by the effect of food, did not the gazelle differ from the roe-buck in its horns. Thoſe of the roe-buck, which may be ſaid to be ſolid, fall off, and are renewed every year, like thoſe of the ſtag. On the contrary, the horns of the gazelle are hollow and permanent, like thoſe of the goat. The roe-buck has alſo no gall-bladder, which both the gazelle and the goat have. On the other hand, the gazelles have, in common with the roe-buck, deep pits under the eyes, and reſemble it ſtill more in the colour and quality of the hair, in the bunches upon their legs, which only differ in being upon the fore legs of the gazelle, and upon the hinder legs of the roe-buck. The gazelles, therefore, ſeem to be of a middle nature between the two animals; but, when we conſider, that the roe-buck is an animal which is to be found in both continents, and that the goats, on the contrary, as well as the gazelles, are not to be met with in the New World, we ſhall eaſily perceive, that theſe two ſpecies, the goat and the gazelle, are more nearly related to each other than they are to the roe buck.

The ſecond gazelle is an animal found in Senegal, and is called the *kevel*. It is ſomewhat leſs than the former, and nearly of the ſize of a ſmall roe buck. It differs alſo in its eyes, which are much larger; and its horns, inſtead of being round, are flatted on the ſides, as well in the male as in the female. In other reſpects, the kevel is entirely like the gazelle.

The third animal is called the *corin*, the name it bears in Senegal. It greatly reſembles the gazelle and the kevel, but is ſtill leſs than either. Its horns too are much ſmaller, and ſmoother than thoſe of the other two; and the annular prominences belonging to this kind are ſcarcely diſcernible.

In the Royal Cabinet of France, there are ſkins of theſe three different gazelles. There is likewiſe a horn which bears a great reſemblance to thoſe of the gazelle and kevel, and only differs from them in being much thicker. Its thickneſs and length ſeem to indicate a much larger animal than the common gazelle; and it appears to belong to a gazelle which the Turks call *tzeran*, and the Perſians *atur*. This animal, according to Olearius, in ſome meaſure, reſembles our deer, except that it is rather of a red colour than brown. The horns, likewiſe, are without antlers, and reſt upon the back, &c. Mr Gmelin, who deſcribes it under the name of *doheren*, ſays, it reſembles the roe-buck, with this exception, that the horns are like thoſe of the ibex, hollow, and, like them never fall off.

To the four firſt ſpecies or tribes of gazelles, muſt be added two other animals, which reſemble them in many things. The firſt is called *koba* at Senegal, where the French have ſtiled it the *great brown cow*. The ſecond, which we call the *kob*, is alſo an animal of Senegal, which the French have denominated the *ſmall brown cow*. The horns of the kob greatly reſemble thoſe of the gazelle and the kevel; but the ſhape of the head is different: the muzzle is much longer, and there are no pits nor depreſſions under the eyes.

The ſeventh animal of this ſpecies, or of this genus, is a gazelle which is found in the Levant, but more generally in Egypt, and in Arabia. It is called, from its Arabian name *algazelle*. It is ſhaped pretty much like the other gazelles, and is nearly of the ſize of a deer; but its horns are long, ſmall, and but little rounded till towards the extremity, when they turn ſhort with a ſharp flexure. They are black, and almoſt ſmooth, and the annular prominences ſcarcely obſervable, except towards the baſe, where they are a little more viſible. They are about three feet long, while thoſe of the gazelle are generally but one foot, thoſe of the kevel fourteen and fifteen inches, and thoſe of the corin (which, nevertheleſs, reſembles this the moſt), only ſix or ſeven inches.

The eighth animal is that which is vulgarly called the *Bezoar gazelle*, but by the eaſtern nations *paſan*, which name we retain. This gazelle is of the ſize of our domeſtic he-goat; and it has the hair, ſhape, and agility of the ſtag. In moſt reſpects, theſe two ſpecies, the *algazelle* and the *paſan*, appear to us to have a great affinity. They are alſo natives of the ſame climate, and found in the Levant, in Egypt, in Barbary, in Arabia, and Perſia; with this difference, however, that the algazelle feeds upon the plains, and the paſan is only found in the mountains. The fleſh of both is very good food.

The ninth gazelle is an animal which is called *nanguer* at Senegal. It is three feet and an half long, two feet and an half high. It is of the colour of the roe-buck, fallow upon the upper parts of the body, white under the belly and upon the hinder parts, with a white ſpot on the neck. Its horns are prominent, like thoſe of the other gazelles, and are about ſix or ſeven inches long. They are black, and round; but, what is very particular in them, is, that near the points they are crooked forwards, as thoſe of the chamois are bent backwards. Theſe nanguers are very beautiful animals, and very eaſily tamed.

The tenth gazelle is a very common animal both in Barbary, and in Mauritania, and ſo well known to the Engliſh, that they have given it the name of the *antelope*. This animal is of the ſize of a roe buck, and greatly reſembles the common gazelle and the kevel, yet differs from them in ſo many particulars, that is it conſidered as an animal of a different ſpecies. This antelope has deeper eye-pits than the common gazelle. Its horns are about fourteen inches long, meeting almoſt at the bottom, ſpreading as they riſe, ſo as, at their tips, to be ſixteen inches aſunder. They have the annular prominences of the gazelle and the kevel, but not ſo diſtinguiſhable as in thoſe. But what ſerves particularly to diſtinguiſh this antelope, is, the double flexure, very uniform and remarkable, ſo that the two horns give a tolerable repreſentation of an antique lyre.

In reviewing all the animals of this claſs, we find that there are about twelve ſpecies, or diſtinct varieties, in the gazelles; and, after having carefully compared them, we ſuppoſe, firſt, that the common gazelle, the kevel, and the corin, are only three varieties of one ſpecies. We next imagine, that the tzeiran, the koba, and the kob, are all three varieties of another ſpecies. Thirdly, we preſume, that the algazelle, and the paſan, are only two varieties of the ſame ſpecies; and we imagine that the name *Bezoar gazelle*, which has been given to the paſan, is no diſtinctive character; for we think ourſelves able to prove, that that the Oriental bezoar does not come from the paſan alone, but from all the gazelles and goats which inhabit the mountains of Aſia. Fourthly, it appears, that the nanguers, whoſe horns are crooked forwards, and which, together, compoſe two or three particular varieties, have been indicated by the ancients under the name of the *dama;* and, filthy, that the antelopes, which are about three or four in number, and which differ from all others by the double flexure of their horns, have alſo been known to the ancients by the names of *ſtrepſicheros*, and of *addax*.

The gazelles are hunted not only with dogs, aſſiſted by the falcon, but alſo, in ſome countries, with the ounce. This animal, tamed for the purpoſe, generally goes with the huntſman; and, when the prey is near, they unchain it, and ſhew it the gazelles. It immediately exerts all its arts and fierceneſs in the purſuit, not, as might be ſuppoſed, by running after them, but by turning and winding about with the utmoſt cunning, till it is near its prey, when it bounds all at once upon the gazelle, ſtrangles it in an inſtant, and ſucks its blood. If it miſſes its aim, which often happens, it reſts in the place, nor does it attempt to purſue them any further; perhaps from the inſtinct, that, as they can run much ſwifter, and a longer time, the chace would be uſeleſs. The maſter then draws near the ounce, coaxing it, and flinging it ſome pieces of fleſh, untill he is near enough to chain, and to bring it back to its former ſtation.

In ſome places, they take wild gazelles by means of a tame one, to the horns of which they faſten a ſnare made of cord. When a herd of gazelles is found, the tame one is ſent among the reſt. It no ſooner approaches, than the males of the wild herd advance to oppoſe him, and, in butting with their horns, are entangled in the nooſe. In this ſtruggle, they both commonly fall to the ground, when the huntſman coming up, kills the one, and diſengages the other.

The antelopes, eſpecially the largeſt ſort, are much more common in Africa than in India. They are ſtronger and fiercer than the other gazelles, from which they are eaſily diſtinguiſhable by the double flexure of their horns: they have alſo no black or brown ſtreaks on their ſides. The middling-ſized antelope is about the ſize and colour of the deer: their horns are very black, their body is very white, and their fore legs ſhorter than the hinder ones. They are well made, and only ſleep in dry and clean places: they are likewiſe very ſwift, very watchful, and very apprehenſive of danger. Hence, in open places, when they ſee a man, a dog, or any other enemy, they fly, with all their ſwiftneſs, till they are out of danger. But, notwithſtanding this natural timidity, they have a kind of courage, if they are ſurpriſed, when they turn ſhort round, and face the enemy that attacks them, with great firmneſs.

The bezoar ſtone is the production not only of gazelles, but of wild and domeſtic goats, and even of ſheep. Probably the formation of this ſtone depends more on the temperature of the climate, and the quality of the food, than on the nature or ſpecies of the animal. Some authors have aſſerted, that the true occidental bezoar, i. e. that which poſſeſſes moſt virtue, is the production of monkeys, and not of gazelles, goats, or ſheep. But this opinion is not founded on a proper baſis; for we have ſeen many of theſe concretions, to which the name of *monkey bezoar* has been given, quite different from the *Oriental bezoar,* which is certainly produced by a ruminating animal, and which is eaſily diſtinguiſhable from all other bezoars, by its ſhape, ſubſtance, and colour, which is generally of an olive brown without and within. The *occidental* bezoar, on the other hand, is of a pale yellow. The ſubſtance of the firſt is alſo ſofter and finer: that of the laſt, harder and drier. The Oriental bezoar has been prodigiouſly in vogue, and a great conſumption has been made of it in the laſt century. Since it has been made uſe of in Europe and in Aſia too, for all caſes in which our preſent phyſicians give cordial medicines, and other antidotes, may we not preſume, by the great quantities which formerly have been, and by what at preſent is conſumed, that this ſtone is produced not from a ſingle ſpecies of animal, but from many; and that it is equally the production of gazelles, goats, and ſheep, that cannot produce it but in certain climates of the Levant and Indies.

This ſtone is formed, as is well known, by concentrical layers, and often contains ſome foreign matter, even from the circumference to the very center. We have enquired into the nature of this matter, which ſerves as a nucleus to the Oriental bezoar, from which a judgement may be formed of the kind of animal that has ſwallowed them. This nucleus is of various kinds, ſometimes pieces of flint, tamarinds, grains of Caſſia, pieces of ſtraw, and the young buds of trees in particular. From the above facts, therefore we can attribute this production only to thoſe animals which brouze upon ſhrubs and leaves.

Garcias ab Horte ſays, that in Corraſon, and in Perſia, there is a kind of goats called paſans, and that it is in their ſtomachs that the bezoar is formed. Hence in the great number of goats that are killed for the ſubſiſtence of the troops, the ſtones are eagerly ſought after, in the ſtomachs of theſe animals, and very commonly found there.

With reſpect to the occidental bezoars, we can affirm, that they proceed neither from goats nor gazelles, nor even any animal of that kind, in all the extent of the New World. Inſtead of gazelles, we only meet with roe-bucks in the woods of America. Inſtead of wild goats and ſheep, animals of a quite different nature are ſeen on the mountains of Peru and Chili, viz. the lambus, and the pacos.

Mr Daubenton, who has more accurately inveſtigated the nature of bezoar ſtones than any other perſon, thinks that they are compoſed of a matter ſimilar to that which faſtens itſelf to the teeth of ruminating animals, in form of a ſhining tartareous matter.

The chamois, and perhaps the ibex of the Alps, the goats of Guinea, and many other animals of America, furniſh bezoar. But farther, if we comprehend under this name, all concretions of this nature which is met with in different animals, we may be aſſured, the moſt quadrupeds, except carnivorous ones, produce bezoar, which is even to be found in crocodiles and alligators.

To form, therefore, a clear idea of theſe concretions, it will be neceſſary to divide them into many claſſes, and fix them to the animals which produced them, obſerving, at the ſame time, the climate, and the food, which contributed moſt to this kind of production.

1. Then, the ſtones which are found in the bladder, and in the reins of men, and other animals, muſt be held diſtinct from the bezoar claſs, and deſcribed by the name of *calculi*, their ſubſtance being quite different from that of the bezoar. They are eaſily known by their weight, their urinous ſmell, and their compoſition, which is not regular, nor formed with concentrical layers, like that of the bezoar.

2. The concretions that are often found in the gall-bladder, and in the liver of the human ſpecies, and of the brute creation, muſt not be regarded as bezoar ſtones, they being eaſily diſtinguiſhable from them, by their lightneſs, their colour, and their inflammability. Beſides, they are not formed by layers encircled round, or nucleuſes, like the bezoar.

3. The balls that are often found in the ſtomach of animals, and eſpecially in thoſe that ruminate, are not real bezoars. Theſe balls, which are called *egagropiles*, are compoſed internally of the hair the animal has licked off, and ſwallowed, or from the hard roots which he has fed upon, and which he could not digeſt. Their external part is encruſted with a viſcous ſubſtance, ſomewhat ſimilar to that of the bezoar. The *egagropiles*, therefore, have nothing in them, except this external layer, of the bezoar; and a ſingle inſpection is ſufficient to diſtinguiſh the one from the other.

4. *Egagropiles* are often found in the animals of temperate climates, but ſcarcely ever any bezoar. Animals of the hotter countries, on the contrary, only produce bezoar. The elephant, the rhinoceros, the goats, the gazelles of Aſia and Africa, the lama of Peru, and others, produce, inſtead of *egagropiles*, ſolid bezoar, whoſe ſubſtance and ſize varies relatively, according to the difference of the animals and the climates.

5. The bezoar to which the greateſt virtues and properties has been attributed, is the Oriental bezoar, which, as we have ſaid, proceeds from goats, gazelles, and ſheep, which feed on the mountains of Aſia. The bezoar of an inferior quality, and which is called *occidental*, is produced from lamas and pacos, which are to be found in the mountains of South America. In ſhort, the goats and gazelles of Africa alſo produce bezoar, but not of ſo good a quality as thoſe of Aſia.

From all theſe circumſtances, we may conclude, that, in general, the bezoar is only a reſidue of the vegetable nutriment, which is not to be found in carnivorous animals, and which is only produced in thoſe that feed on plants. Beſides in the mountains of Southern Aſia, the herbage being ſtronger than in any other part of the world, the bezoar which is made from the reſidue of that food, has alſo more virtues than any other. In America, where the heat is leſs, the graſs of the mountains weaker, the bezoars produced there, are inferior to the firſt. In Europe too, where the graſs is ſtill weaker, and in all the valleys of both continents, no bezoar is produced, but only *egagropiles*, which contain nothing but hair or roots, and very hard filaments, which the animal was unable to digeſt.

The Bubalus, or Stag like Antelope.

The name of bubalus has been very improperly applied to the buffalo, of which we have already taken notice in our deſcription of that animal. It belonged formerly only to the animal in queſtion, which is of a nature very different from that of the buffalo. It reſembles the ſtag, the gazelle, and the ox, in many very remarkable reſpects. It is very like the ſtag in the ſize and ſhape of its body and legs; but its horns are permanent, and nearly like thoſe of the largeſt gazelles; which animal it alſo reſembles in its natural habits Its head, however, is much longer than that of the gazelle, and even than that of the ſtag; and it reſembles the ox, by the length of the muzzle, and the diſpoſition of the bones of the head.

The horns of the bubalus are crooked backwards, and twiſt like a corkſcrew. The ſhoulders are elevated, ſo that they form a ſort of bunch upon the withers. The tail is almoſt a foot long, and furniſhed with a quantity of hair at its extremity.

The hair of the bubalus is like that of the elk, fine towards the root, thick in the middle and extremity. This character is peculiar to theſe two animals; for the hair of almoſt every quadruped is thicker at the root than at the middle and point. The hair is nearly of the ſame colour as that of the elk, though much ſhorter, thinner, and ſofter; and theſe alone are the reſemblances between the bubalus and the elk.

The bubalus is common in Barbary, and in all the northern parts of Africa. It is nearly of the ſame nature as the antelope, and has, like it, ſhort hair, and a black hide, and fleſh which makes very good food.

The Condoma, or ſtriped Antelope.

The Marquis de Marigny ſhewed me, in his cabinet, the head of an animal, which, at firſt I ſuppoſed to have belonged to a great bubalus. It is like thoſe of our largeſt ſtags; but the horns, inſtead of being ſolid like thoſe of the ſtag, are large and hollow, with a ridge like thoſe of the goat kind, and with varied flexures like thoſe of the antelope. In examining the royal cabinet for what might be there relative to this animal, we found two horns which belonged to it. The firſt, without any mark or name, came from his Majeſty's wardrobe. The ſecond was given to me, in 1760, by M. Bauchis, Commiſſionary of the Marines, with the name of the Condoma of the Cape of Good Hope affixed to it. We have thought proper to adopt the laſt name, as the animal which it denotes has never before been deſcribed nor denominated.

The Guib, or Harneſſed Antelope.

In ſearching the narratives of travellers, for thoſe marks which might have an affinity with the remarkable ſize of the horns of this animal, we can find none which have a nearer relation to it than thoſe of the animal indicated by Kolbe, by the name of the *wild goat* of the Cape of Good Hope.—"This goat," he ſays, "to which the Hottentots have not as yet given a name, and which I call the *wild goat*, is very remarkable in many reſpects. It is about the ſize of a large ſtag. Its head is very handſome, ornamented with two crooked and pointed horns, about three feet long, and, at their extremities, about two feet diſtant. All along the back there runs a white ſtripe, which ends at the inſertion of the tail; another, of the ſame colour, croſſes this, at the bottom of the neck, which it entirely ſurrounds. There are two more running round the body, one behind the fore legs, and one parallel to it, before the other. The colour of the reſt of the body is greyiſh, except the belly, which is white. It has alſo a long, grey beard; and its legs, though long, are well proportioned."

The guib, or harneſſed antelope, is an animal which has not been pointed out by any naturaliſt, nor even by any traveller, notwithſtanding it is common enough in Senegal. It reſembles the gazelles, eſpecially the nanguer, in the ſize and ſhape of its body, in the fineneſs of its legs, in the ſhape of its head and muzzle, in the eyes, in the ears and length of its tail, and in the want of a beard; but every gazelle, eſpecially the nanguer, has the colour of the belly white, while the breaſt and belly of the guib is of a deep brown. It alſo differs from the gazelles by the horns, which are ſmooth, and not marked with annular prominences. They are alſo a little compreſſed; and the guib, in theſe particulars, is more like the goat than the gazelle. Notwithſtanding this, it is neither the one nor the other, but of a particular kind, which ſeems to us to be intermediate between the gazelle and the goat. It is alſo remarkable for white ſtripes on a brown ground, which are diſpoſed along the animal's body, as if it were covered with a harneſs. It feeds in company; and they are found in numerous herds in the plains of Pador.

The Grimm.

This animal is only known to naturaliſts by the name of the *wild goat of grimmius*; and, as we are not acquainted with the name it bears in its own country, we cannot do better than adopt this precarious denomination. There are two characters which are ſufficient to diſtinguiſh it. The firſt is a very deep cavity under each eye; the ſecond is a tuft of hair, ſtanding upright on the top of the head. It reſembles both the goat and the gazelle, not only in the ſhape of its body, but even in its horns, which are annulated towards the baſe, and have longitudinal ſtreaks, like thoſe of the gazelles. At the ſame time, they are very ſhort, and bend backwards in an horizontal direction. There is ſome reaſon to think, that the male grimm alone is furniſhed with horns.

The Chevrotins.

We have given the name of *Chevrotin (tragulus)* to thoſe ſmall animals of the hotter countries of Africa and Aſia, which almoſt every traveller has denominated *ſmall ſtags*, or *little hinds*. In fact, the chevrotin is a miniature reſemblance of the ſtag, by the ſhape of its muzzle. the delicacy of its body, the ſhortneſs of its tail, and the ſhape of its legs; but it differs greatly from it in the ſize; the largeſt chevrotins never being found longer than the hare. In other reſpects, the horns of thoſe which have any, are hollow, annulated, and nearly reſembling the gazelles. Their foot is cloven, and is alſo more like that of the gazelle than that of the ſtag kind. They differ both from the gazelle and the ſtag, by not having any depreſſions or hollows under their eyes, and in that reſpect approach nearer the goat kind; but, the truth is, they are neither ſtag, gazelle, nor goat, and conſtitute one or more diſtinct ſpecies. Seba gives the figures and the deſcriptions of five chevrotins: the firſt, the *ſmall red Guinea hind, without horns*: the ſecond, the *fawn*, or *ſmall African ſtag*: the third, the *ſmall young ſtag of Guinea*: the fourth, the *ſmall red and white ſpotted hind of Surinam*; the fifth, the *red-haired*

African ſtag. Of theſe five chevrotins mentioned by Seba, the firſt, ſecond, and third, are evidently the ſame animal: the fifth, which is larger than the three firſt, and whoſe hair is redder, longer, and of a deeper brown, ſeems to us to be only a variety of this ſpecies. The fourth which the author points out as an animal of Surinam, is, according to our opinion, a ſecond variety of this ſpecies, which is only found in Africa, and in the ſouthern parts of Aſia.

Theſe animals are of an elegant make, and finely proportioned for their ſize. But, though they leap and bound with prodigious ſwiftneſs, yet, they do not appear able to continue it for a long time; for the Indians often hunt them down; and the Negroes likewiſe purſue them, and knock them down with their ſticks. They are eagerly ſought for, as their fleſh is excellent food. They can only live in exceſſively hot climates; and they are ſo exceedingly delicate, that it is with the greateſt trouble they are tranſported into Europe alive, where they periſh in a ſhort time. They are eaſily tamed, very familiar, and beautiful. The chevrotin is, without doubt, the leaſt of all cloven-footed animals. According to this character, they ſhould not bring forth many young; but, if we reaſon from their ſmall ſize, we ſhould imagine they brought forth ſeveral at a time. They are exceedingly numerous in the Indies, Java, Ceylon, Senegal, Congo, and in every other country that is exceſſively hot, but they are not to be found in America, nor in any of the temperate climates of the Old Continent.

Mazame.

Mazame, in the Mexican language, was the name of the ſtag, or rather of the whole race of ſtags, deer, and roe-bucks. Travellers diſtinguiſh two kinds of mazames, both common to Mexico and New Spain; the firſt and largeſt, to which they give the ſimple name of mazame, has a horn like that of the roe-buck of Europe, about ſix or ſeven inches long, with the extremity divided into two points. The ſecond, called *temamacame*, is leſs than the former, and has but a ſingle horn, and without any antlers. Theſe two animals ſeem to be roe-bucks; the firſt of which is abſolutely of the ſame ſpecies as the European roe-buck, and the ſecond no more than a variety of it.

The Coudous, or Indian Antelope.

Of all animals thoſe that chew the cud are the moſt numerous, and moſt varied. In the very great quantity of horns collected together in the Royal Cabinet, or diſperſed in private collections, there ſtill remains one without label, without name, and of which we have no other information than what we can procure from the ſubject itſelf. This horn is large, almoſt ſtrait, and very thick and black. It is not ſolid like that of the ſtag, but reſembles that of the ox. After ſearching in a number of different cabinets, we at laſt found, in that of Mr Dupliex, a head adorned with two horns, reſembling the one we juſt now mentioned: this was labelled with theſe words—*The horns of an animal nearly like a horſe, of a greyiſh colour, with a mane before its head: it is called at Pondicherry*, COESDOES, *which ſhould be pronounced* COUDOUS.

The coudous may poſſibly be of the buffalo ſpecies; and the travellers in Africa, where the buffalo is as frequent as in Aſia, more preciſely mention a kind of buffalo, called *pacaſſe* at Congo, which, by the indexes ſeems to us to be the coudous. "In the route from Louanda to the kingdom of Congo, we perceived," ſay they, "two pacaſſes, animals very like buffaloes, and which roar like lions. The male and female go always together. They are white, ſpotted with red and black. Their ears are about half an ell long; and their horns are ſhort. They neither fly at the ſight of the human ſpecies, nor do they do them any injury, but only look at them as they paſs by."

The Muſk Animal.

To finiſh a complete hiſtory of goats, and other animals of this genus, there is only one remaining to be deſcribed, which is as famous as it is unknown. The animal we mean, is that which produces the muſk, which all modern naturaliſts, and the greateſt part of travellers through Aſia have mentioned, ſome by the name of the ſtag, roe-buck, and muſk goat; others have conſidered it as a large chevrotin. It ſeems indeed to be of an ambiguous nature, participating of all the above animals, although, at the ſame time, we can aſſert, that its ſpecies is different from any other. It is about the ſize of a ſmall roe-buck, or gazelle; but its head is without horns; and by this character it reſembles the *memina*, or chevrotin of India. It has two great canine teeth or tuſks in the upper jaw, in which it reſembles the chevrotin; but, what diſtinguiſhes it from all other animals, is a kind of bag, about two or three inches in diameter, which grows near the navel, and in which a liquor filtrates, which differs from civet by its ſmell and conſiſtence. Neither the Greeks nor Romans have made any mention of the muſk-animal; and Grew is the only perſon who has given an exact deſcription of it from its ſkin. The deſcription is as follows:

The muſk ſtag is about three feet ſix inches long, from the head to the tail; and the head is about half a foot; the neck, ſeven or eight inches; the fore part of the head, three inches broad, and like that of the greyhound. The ears are erect, like thoſe of a rabbit, and about three inches long: the tail is not above two inches: the fore legs are about thirteen or fourteen inches high. It is cloven-footed, armed behind and before with two horned ſubſtances; but it has none on the hind feet.

The bladder or bag which contains the muſk is about three inches long, two broad, and projects from the belly about an inch and an half. The animal has twenty-ſix teeth. There is alſo a tuſk, or canine tooth, about two inches and an half long, on each ſide in the upper jaw, which terminate in the form of a hook. It has no horns. The hair of this animal is long and rough, the muzzle pointed, and tuſks that are ſomewhat like thoſe of the hog. By theſe marks it reſembles the boar kind, and perhaps ſtill more that of the *babirouſſa*, which the naturaliſts have denominated the *Indian boar*. The American hog alſo, which we call *pecari*, has a bag or cavity on its back, containing a great deal of a very odoriferous humour. In general, thoſe animals which produce odoriferous liquors, as the badger, the caſtor, the pecari, the oudatra, the derman, the civet, the zibet, are not of the ſtag or goat kind. Hence we might be induced to think, that the muſk animal is nearer the hog ſpecies than that of the goat.

In reſpect to the matter of muſk itſelf, its eſſence is perhaps as little known as the nature of the animal which produces it. All travellers agree, that the muſk is always mixed and adulterated with blood, or ſome other drugs, by thoſe who ſell it. The Chineſe not only increaſe the quantity by this mixture, but they endeavour likewiſe to increaſe the weight, by incorporating with it lead very finely ground. The pureſt and the beſt muſk, is that which the animal depoſits upon trees or ſtones, againſt which it rubs itſelf when the quantity renders it uneaſy. The muſk which is brought over in the bag, is very ſeldom ſo good, becauſe it is not ripe, or becauſe it is only in their rutting ſeaſon that it acquires all its ſtrength and all its ſmell. It is at this time too that the animal endeavours to diſburthen itſelf of this pure matter, which then occaſions ſuch violent itchings and irritations. A ſingle grain of muſk is ſufficient to perfume a great deal of other matter; and the odour expands itſelf to a very great diſtance. The ſmalleſt particle is ſufficient to perfume a conſiderable ſpace; and the perfume itſelf is ſo permanent, that, at the end of ſeveral years, it does not ſeem to have loſt much of its power.

CHAP. XIX.

OF THE BABIROUSSA, OR INDIAN HOG—THE CABIAI—THE PORCUPINE—THE COUANDO—THE URSON—THE ASIATIC HEDGE-HOG—THE CAMELEOPARD—THE LAMA, AND PACO.—THE SLOTH—THE SURICAT—THE TARSIER—THE PHALANGER—THE COQUALLIN—THE HAMSTER—THE BOBAK—THE JERBOA—THE ICHNEUMON—THE FOSSAN—THE VANSIRE—THE MAKI, OR MAUCACAU—THE LORI—THE JAVELIN BAT.

The Babirouſſa, or Indian Hog.

ALL naturaliſts have conſidered this animal as a kind of hog, though it has neither the head, ſhape, briſtles, nor tail of a hog. Its legs are longer, and its muzzle ſhorter. It is covered with ſoft and ſhort hair like wool. Its body is likewiſe not ſo thick and clumſy as that of the hog: its hair is grey, mixed with red and a little black: its ears are ſhort and pointed; but what diſtinguiſhes it from all other animals, are four enormous tuſks, or canine teeth, the two ſhorteſt of which ſhoot out of the lower jaw, like thoſe of the boar. The other two, which come from the upper jaw, pierce the cheeks, or rather the upper part of the lips, and riſe crooked almoſt to the eyes. Theſe tuſks are of a very beautiful ivory, much ſmoother and finer, but not ſo hard as thoſe of the elephant.

Theſe quadruple and enormous tuſks, give theſe animals a very formidable appearance; they are, however, leſs dangerous than our wild boars. Like them they herd together; and they have a very ſtrong ſmell, by which they are eaſily diſcovered, and hunted with ſucceſs. They grunt terribly, defend themſelves, and wound their enemy with their under tuſks; for the upper are of no uſe to them. Although wild and ferocious as the boar, they are tamed with great eaſe; and their fleſh, which is very good food, putrefies in a very ſhort time. As their hair is fine, and their ſkin delicate, it is ſoon penetrated by the teeth of the dogs, who hunt them in preference to wild boars. The babirouſſa ſtrikes its upper tuſks into the branches of trees, to reſt its head, or to ſleep ſtanding. This habit it has in common with the elephant, who, in order to ſleep in an erect poſture, ſupports its head by fixing the end of its tuſks in the holes which he makes in his lodging.

The babirouſſa differs ſtill more from the wild boar by its natural appetites. It feeds upon graſs and leaves of trees, and does not endeavour to enter gardens, to feed on beans, peaſe, and other vegetables; while the wild boar, who lives in the ſame country, feeds upon wild fruits, roots, and often on the booty it carries off from gardens. Theſe animals that go alike in herds never mix: the wild boars keep on one ſide, and the babirouſſas on the other: theſe walk quicker, and have a very fine ſmell. They often fix themſelves againſt a tree, to keep off the hunters and their dogs. When they are purſued, they make towards the ſea, and, ſwimming with great dexterity, very often eſcape; for they often ſwim from one iſland to another.

The babirouſſa is found not only in the iſland of Bouro, or Boero, near Amboyna, but alſo in many parts of Southern Aſia and Africa; as at Eſtrila, Senegal, Madagaſcar, &c. We have not had it in our power to convince ourſelves, that the female had not the two tuſks which are ſo remarkable in the male; but moſt authors, who have taken notice of this animal, ſeem to agree in this circumſtance.

The Cabiai.

This American animal has never yet made its appearance in England. It is not a hog, as naturaliſts and travellers pretend: it even reſembles it only by trifling marks, and differs from it by ſtriking characters. The largeſt cabiai is ſcarcely the ſize of a hog of eighteen months growth. The head is longer; the eyes are larger; the ſnout, inſtead of being rounded, as in the hog, is ſplit like that of a rabbit or hare, and furniſhed with thick, ſtrong whiſkers. The mouth is not ſo wide: the number and form of the teeth are different; for it is without tuſks. Like the peccary, it wants a tail, and, unlike to all others of this kind, is in a manner web-footed, and thus eaſily fitted for ſwimming and living in water. The hoofs before are divided into four parts, and thoſe behind into three: between the diviſions, there is a prolongation of the ſkin. Hence the feet, when opened in ſwimming, can beat a greater ſurface of water.

This animal, ſwims in the water, like a badger, ſeeks the ſame prey, ſeizes the fiſh with its feet and teeth, and carries them to the edge of the lake, to devour them with the greater eaſe. It lives alſo upon fruits, corn, and ſugar-canes. As its legs are broad and flat, it often ſits upon its hind-legs. Its cry reſembles more the braying of an aſs than the grunting of an hog. It ſeldom ſtirs out but at night, and almoſt always in company, without going far from the ſides of the water. It can find no ſafety by flight; and, in order to eſcape its enemies which purſue it, it plunges into the water, remains at the bottom a long time, and riſes at ſuch a great diſtance, that the huntſmen loſe all hopes of ſeeing it again. It is fat; and the fleſh is tender, but, like that of the badger, rather of a fiſhy taſte. The head, however, is not bad; and this agrees with what is ſaid of the beaver, whoſe exterior parts have a taſte like fiſh.

The cabiai is quiet and gentle. It is eaſily tamed, and willingly follows the hand that feeds it. We do not know the time of their bringing forth their young; nor their growth, and conſequently the length of life of this animal. They are very common in Guiana, as well as in Braſil, in Amazonia, and in all the lower countries of South America.

The Porcupine.

The name of this animal makes many imagine, that it is only a hog covered with quills, when, in fact, it only reſembles that animal by its grunting. In every other reſpect, it differs from the hog as much as any other animal, as well in external appearance, as in the interior conformation. Inſtead of a long head and ears, armed with tuſks, and terminated with a ſnout. Inſtead of a cloven foot, furniſhed with hoofs like the hog, the porcupine has a ſhort head like that of the beaver, with two large inciſive teeth in the fore-part of each jaw. It has no tuſks, nor canine teeth. Its muzzle is divided like that of the hare. Its ears are round and flat, and the feet armed with nails. Inſtead of a large ſtomach with an appendix in form of a caul, the porcupine has only a ſingle ſtomach, with the large cœcum gut. The parts of generation do not appear externally, as in the male hog. Its teſticles, and the other parts of generation, are likewiſe concealed in the body. By all theſe marks, as well as by its ſhort tail, its long whiſkers, and its divided lip, it participates more of the hare, or beaver kind, than that of the hog. The hedge-hog, indeed, which is, like the porcupine, covered with prickles, is ſomewhat reſembling the hog; for it has a long muzzle, terminated by a kind of ſnout. All theſe reſemblances however, being very diſtant, it ſeems that the porcupine is a different ſpecies from that of the hedge-hog, the beaver, the hare, or any other animal with which it may be compared.

Travellers and naturaliſts have almoſt unanimouſly agreed, that this animal has the faculty of diſcharging its quills, and wounding its foes at an immenſe diſtance. They add that theſe quills have the peculiar property of penetrating into the fleſh, as ſoon as the point has made an entrance through the ſkin. Theſe ſtories, however, are all purely imaginary, and without the ſmalleſt foundation. The error ſeems to have ariſen from this animal raiſing his prickles erect, when he is irritated; and, as there are ſome of them which are only inſerted into the ſkin by a ſmall pellicle, they eaſily fall off. We have ſeen many porcupines, but have never obſerved them dart any of their quills from them, although they were violently agitated. We cannot, therefore but be much aſtoniſhed, that the greateſt authors, both modern and ancient, as well as the moſt judicious travellers, have ſubſcribed to a circumſtance ſo entirely falſe. In juſtice, however, to Dr Shaw, we muſt except him from the number of theſe credulous travellers: "Of all the number of porcupines," ſays he, "which I have ſeen in Africa, I have never yet met with one which darts its quills, however ſtrongly it was irritated. Their common method of defence is to lie on one ſide, and when the enemy comes in to cloſe quarters, to riſe ſuddenly, and wound him with the points of the other.

The porcupine, although a native of the hotteſt climate of Africa and India, lives and multiplies in colder countries, ſuch as Perſia, Spain, and Italy. Agricola ſays, that the ſpecies was not tranſported into Europe before the laſt century. They are found in Spain, but more frequently in Italy, eſpecially on the Appenine mountains and in the environs of Rome.

The porcupine, in its domeſtic ſtate, is neither furious nor vicious. It is only anxious for its liberty; and, with the aſſiſtance of its fore-teeth, which are ſharp and ſtrong, like thoſe of the beaver, it eaſily breaks through a wooden priſon. It is alſo known, that it feeds willingly on fruits, cheſnuts, and crumbs of bread; that, in its wild ſtate, it lives upon roots and wild grain; that, when it can enter a garden, it makes great havock, upon the herbs, roots, fruits, &c. It becomes fat, like moſt other animals, towards the end of ſummer; and its fleſh, although inſipid, is tolerably palatable.

When the form, ſubſtance, and organization of the prickles of the porcupine are conſidered, they are found to be true quills, to which only feathers are wanting to make them exactly reſemble thoſe of birds. They ſtrike together with a noiſe as the animal walks; and it eaſily erects them in the ſame manner as the peacock ſpreads the feathers of his tail.

The Couando, or Brazillian Porcupine.

The porcupine, is a native of the hot countries of the Old World; but, notwithſtadding it has not been found in the New, travellers have given its name to animals which ſeem to reſemble it, and particularly to that of which we are about to take notice. On the other hand, the Couando of America has been tranſported to the Eaſt Indies; and Piſon, who probably was not acquainted with the porcupine, has engraved in Bontius the couando of America, under the name and deſcription of the true porcupine. The couando, however, is not a porcupine, it is far leſs: its head and muzzle is ſhorter: it has no tuft on its head, nor ſlit in the upper lip: its quills are ſometimes ſhorter and much finer: its tail is long, and that of the porcupine is very ſhort. In a word, it is rather carnivorous, whilſt the porcupine is only frugivorous. It ſleeps all the day like the hedge-hog, and only ſtirs out in the night: it climbs up trees, and hangs in the branches by its tail, which the porcupine cannot do. All travellers agree, that its fleſh is very palatable. It is eaſily tamed, and commonly lives in high places. Theſe animaals are found over all America, from Braſil and Guiana, to Louiſiania and the ſouthern parts of Canada; while the porcupine is only to be met with in the hotteſt parts of the Old Continent.

In transferring the name of porcupine to the couando, they have ſuppoſed and tranſmitted to him the ſame faculties, eſpecially that of lancing its quills. Ray is the only perſon who has denied theſe circumſtances, although they appear, at firſt view, to be abſurd.

The Urſon, or Canada Porcupine.

This animal, placed by Nature in the deſart part of North America, exiſts independent of, and far diſtant from, man. The *urſon* might be called the *ſpiny beaver*, it being of the ſame ſize, the ſame country, and the ſame form of body. It has, like that, two long, ſtrong, and ſharp inciſive teeth at the end of each jaw: its prickles are ſhort, and almoſt covered with its hair; for the urſon, like the beaver, has a double coat. The firſt conſiſts of long and ſoft hair, and the ſecond of a down, or felt, which is ſtill ſofter and ſmoother. In the young urſons, the prickles are proportionably larger, more apparent, and the hair ſhorter and ſcarcer than in the adults.

This animal diſlikes water, and is fearful of wetting itſelf. He makes his habitation under the roots of great hollow trees, ſleeps very much, and chiefly feeds upon the bark of juniper. In winter, the ſnow ſerves him for drink; in ſummer, he laps water like a dog. The ſavages eat his fleſh, and ſtrip the briſtles off the hide, which they uſe inſtead of pins and needles.

The Tanrec, and Tendrac, or Aſiatic Hedge-Hogs.

The Tanrec, and Tendrac, or Aſiatic Hedge-hogs, are two ſmall animals of the Eaſt Indies, which ſomewhat reſemble our hedge-hog, but are ſufficiently different to conſtitute a different ſpecies. What ſtrongly proves this, is, their not rolling themſelves up in the ſhape of a ball, like the hedge hog; and where the tanrecs are found, as at Madagaſcar, hedge-hogs are alſo to be met with of the ſame ſpecies with ours.

There appear to be tanrecs of two ſpecies, or perhaps of two different breeds. The firſt, which is nearly as large as our hedge-hog, has its muzzle proportionably longer. Its ears too are more apparent, and leſs furniſhed with prickles, than thoſe of the ſecond, to which we have given the name of tendrac, to diſtinguiſh it from the reſt. The tendrac is not larger then a rat: its muzzle and its ears are ſhorter than thoſe of the tanrec; which laſt is covered with ſhorter prickles, as numerous as thoſe of the hedge-hog. The tendrac on the other hand has them only on the head, neck and ſhoulders; the reſt of the body being covered with a coarſe hair, not unlike the briſtles of an hog.

Theſe little animals, whoſe legs are ſmall, move but ſlowly: they grunt like an hog, and wallow, like it, in mire: they are for the moſt part in creeks and harbours of ſalt water: they multiply in great numbers, and make themſelves holes in the ground, and ſleep for ſeveral months. During this torpid ſtate, their hair falls off, which is renewed upon their revival. They are uſually very fat; and although their fleſh be inſipid, ſoft and ſpongy, yet the Indians conſider it as a very great delicacy.

The Cameleopard.

The cameleopard is one of the talleſt, moſt beautiful, and moſt harmleſs of animals. The enormous diſproportion of its legs (the fore legs being as long again as the hinder ones) is a great obſtacle to the uſe of its ſtrength. Its motion is waddling and ſtiff: and it can neither fly from its enemies in its free ſtate, nor ſerve its maſter in a domeſtic one. The ſpecies is not very numerous, and have always been confined to to the deſarts of Ethiopia, and ſome other provinces of Africa and India. As theſe countries were unknown to the Greeks, Ariſtotle makes no mention of this animal; but Pliny ſpeaks of it, and Oppian deſcribes it thus. "The cameleopard," ſays this author, "has ſome reſemblance to the camel: its head and ears are ſmall, its feet broad, and its legs long; but the height of the laſt is very unequal, the fore legs being much longer than the hinder, which are very ſhort. Hence, when the animal appears ſtanding and at reſt, it is not unlike a dog ſitting. There are two prominences upon the head, juſt between the ears, which reſemble two ſmall and ſtrait horns. Its mouth is like the ſtag's; its teeth ſmall and white: its eyes are full of fire: its tail is ſhort, and furniſhed with black hairs at the end."

"There is," ſays Strabo, "a large beaſt in Ethiopia, called *camelopardalis;* although it bears no reſemblance to the panther, for its ſkin is not ſpotted in the ſame manner. The ſpots of the panther are orbicular,

cular, and thoſe of this animal are long, and nearly reſemble thoſe of the fawn, or young ſtag." Gillius's deſcription ſeems to me ſtill better: "I have ſeen," ſays he, "three cameleopards at Cairo. On their heads are two horns, ſix inches long; and, in the middle of their forehead, a tubercle riſes to about two inches high, which appears like a third horn. This animal is ſixteen feet high when he holds his head erect. Its neck alone is ſeven feet: and it is twenty feet long, from the tip of the noſe to the end of the tail. Its fore and hind legs are nearly of an equal height; but the thighs before, are ſo long in compariſon to thoſe behind, that its back ſeems to ſlope like the roof of an houſe. Its whole body is ſpeckled with large brown ſpots, which are nearly of the ſame form. Its feet are cloven like thoſe of the ox."

In comparing the accounts travellers have given of the cameleopard, I find a tolerable agreement between them. They all agree, that it can reach with its head to the height of ſixteen or ſeventeen feet, when ſtanding erect; and that the fore legs are twice as high as the hinder ones; ſo that it ſeems as if it were ſeated upon its crupper. They all likewiſe agree, that they cannot run very ſwift, on account of this diſproportion that they are very gentle, and that by this quality, and even by the ſhape of the body, it partakes more of the ſhape and nature of the camel than of any other animal. They add too that it is among the number of ruminating animals, and, like them, is deficient of the inciſive teeth in its upper jaw. From the authority of ſome, we find, that the cameleopard is to be met with in the ſouthern parts of Africa, as well as in thoſe of Aſia.

It is very clear from what we have mentioned, that the cameleopard is a very different ſpecies from every other animal, but, if we referred it to any, it would be to that of the camel, rather than to that of the ſtag.

We are ignorant of the ſubſtance of the horns of the cameleopard; and in that part it may reſemble the ſtag more than the ox, though poſſibly they may be neither ſolid, like thoſe of the firſt, nor hollow, like thoſe of the ox, goat, &c. They may be compoſed of united hairs, like thoſe of the rhinoceros, or of a ſubſtance and texture entirely peculiar to themſelves. The horns of the cameleopard are ſurrounded with large, coarſe hair, and not covered with a down or velvet, like thoſe of the ſtag. This circumſtance might incline us to ſuppoſe they were compoſed of united hair, nearly like thoſe of the rhinoceros. The tubercle in the middle of the head ſeems to form a third horn, and is another ſtrong circumſtance in favour of this opinion. The other two which are not pointed, but have moſſy knobs at their ends, are perhaps only tubercles not unlike the former. Travellers inform us, that the female cameleopards have horns like the males, with this difference only, that they are ſmaller. If this animal, therefore, were of the ſtag kind, the analogy would be violated here likewiſe; for, of all ſuch animals, only the female rein-deer has horns.

The Lama, and the Paco.

There are examples, in every language, of two different names being appropriated to the ſame animal; one of which has a relation to its wild, and the other to its domeſtic ſtate. The wild boar and the hog are the ſame animal, under two names, which relate only to the condition of the ſpecies, of which one part is under the power of man, and the other independent of him. It is the ſame with reſpect to the lamas and the pacos, which were the only domeſtic animals of the ancient Americans. Theſe names, then, belong to their domeſtic ſtate. The wild lama is called *huanacus*, or *guanaco;* and the wild paco, *vicunna*, or *vigogne*. I thought this remark neceſſary to avoid the confuſion of names. Theſe animals are not to be found in the Old Continent, but only belong to the New. They ſeem even to belong to ſome particular parts, beyond the limits of which they are never to be ſeen. They appear attached to the chain of mountains which ſtretch from New Spain to the Streights of Magellan: they inhabit the higheſt regions of the globe, and ſeem to require a purer and more rarified air than that of our higheſt mountains.

It is very ſingular, that, although the lama and the paco are domeſticated in Peru, Mexico and Chili, as the horſes are in Europe, or the camels in Arabia, we are almoſt ſtrangers to them. Peru, according to Gregory de Bolivar, is the true and native country of the lamas. They are conducted indeed into other provinces, as New Spain, &c. but this is rather for curioſity than utility; but in Peru, from Potoſi to Curacas, they abound, and conſtitute the chief riches of the Indians and Spaniards, who rear them. Their fleſh is excellent food: their hair, or rather wool, may be ſpun into beautiful clothing; and they are capable of carrying heavy loads in the moſt rugged and dangerous ways. The ſtrongeſt of them will travel with two hundred, or two hundred and fifty pounds weight on their backs. Notwithſtanding their pace is but ſlow, and their journey is ſeldom above fifteen miles a day, they deſcend precipices, and find footing among the moſt craggy rocks, where even men can ſcarcely accompany them. They commonly travel for five days together, after which they reſt, for two or three days. They are chiefly employed in carrying the riches of the mines of Potoſi. Bolivar affirms, that, in his time, above three hundred thouſand of theſe animals were in actual employ.

The growth of the lama is very quick; and its life is but ſhort. This animal couples at three years of age, and remains ſtrong and vigorous till twelve; after which it begins to decline, and becomes entirely uſeleſs at fifteen. Their nature appears modelled on that of the Americans. They are gentle and phlegmatic, and do every thing with the greateſt leiſure and caution. When they ſtop on their journeys, they bend their knees very cautiouſly, in order to lower their bodies without diſordering their load. As ſoon as they hear their driver whiſtle, they riſe up with the ſame precaution, and proceed on their journey. They feed as they go along on the graſs they meet with in their way, but never eat in the night, making uſe of that time to ruminate. The lama ſleeps, like the camel, with its feet folded under its belly, and ruminates in that poſture. When overloaded or fatigued, it falls on its belly, and will not riſe, though its driver ſtrikes it with his utmoſt force.

The lama is about four feet high: its body, comprehending the neck and head, is five or ſix feet long: its neck alone is near three feet. The head is ſmall and well proportioned, the eyes large, the noſe ſomewhat long, the lips thick, the upper divided, and the lower a little depending. It wants the inciſive and canine teeth in the upper jaw. The ears are four inches long, and move with great agility. The tail is ſeldom above eight inches long, ſmall, ſtrait, and a little turned up at the end. It is cloven footed, like the ox; but the hoof has a kind of ſpear like appendage behind, which aſſiſts the animal to move and ſupport itſelf over precipices and rugged ways. The back, the crupper, and the tail, are clothed with ſhort wool; but it is very long on the belly and ſides. Theſe animals differ in colour; ſome are white, others black, but moſt of them are brown.

Theſe uſeful, and even neceſſary animals, are attended with no expence to their maſters; for, as they are cloven-footed, they do not need to be ſhod, nor do they require any ſhelter from the inclemency of the weather, as their wool ſupplies them with a warm covering. Satisfied with a ſmall portion of vegetables and graſs, they ſtand in need of neither corn nor hay; they are ſtill more moderate in what they drink, as their mouths are continually moiſtened with ſaliva, which they have in a greater quantity than any other animal. The natives hunt the huanacus, or wild lama, for the ſake of its fleece. The dogs have much trouble to follow them; and, if they do not come up with them before they gain the rocks, both the huntſmen and the dogs are obliged to give up their purſuit.

The pacos are a ſubordinate kind to the lamas, much in the ſame proportion as the aſs is to the horſe. They are ſmaller, and not ſo ſerviceable; but their fleece is more uſeful. Their wool is fine and long, and is a ſort of merchandiſe, as valuable as ſilk. The natural colour of the pacos is that of a dried roſe-leaf, which is ſo fixed, that it undergoes no alteration in the hands of the manufacturer. Gloves, ſtockings, quilts, and carpets, are manufactured of this wool, which far exceed thoſe of the Levant.

The pacos alſo reſemble the lamas in their form, except that their legs are ſhorter, and their muzzle thicker and cloſer. They inhabit and climb over the higheſt parts of the mountains. The ſnow and ice ſeem rather agreeable to them than otherwiſe. When wild, they keep together in flocks, and run very ſwift; but, as ſoon as they perceive a ſtranger, they take flight, and drive their young before them. The ancient monarchs of Peru rigorouſly prohibited the hunting of them, as they multiply ſlowly; but, ſince the arrival of the Spaniards in theſe parts, their number is greatly decreaſed. The fleſh of theſe animals is not ſo good as that of the huanacus; and they are only ſought after for their fleece, and the bezoar they produce. The method of taking them, proves their extreme timidity, or rather their weakneſs. The huntſmen having driven the flock into a narrow paſſage, acroſs which they have ſtretched a rope about four feet from the ground, with a number of pieces of linen or cloth hanging on it, the animals are ſo intimidated at theſe rags agitated by the wind, that they ſtop, and, crowding together in a heap, large numbers of them are killed with the greateſt eaſe. If there are any huanacus, however, among the flock, which are leſs timid than the pacos, they leap over the rope with great agility. The example is immediately followed by the whole flock, and they elude the ſtratagem of their purſuers.

With reſpect to the domeſtic pacos, they are accuſtomed to carry burdens, like the lamas; but, being ſmaller and weaker, they carry much leſs weight. They are likewiſe of a more ſtubborn nature; and, when once they reſt with their load, they will ſuffer themſelves to be cut to pieces ſooner than riſe. The Indians have never made uſe of the milk of theſe animals, as they have ſcarcely enough to ſupply their young. The great profit derived from their wool, has induced the Spaniards to endeavour to naturalize them in Europe. They have tranſported them into Spain, in hopes to raiſe the breed in that country; but, the climate not agreeing with their nature, none of them lived. I am perſwaded, however, that theſe animals, which are more valuable than the lamas, might thrive upon our mountains, eſpecially upon the Pyrenean. Thoſe who brought them into Spain, did not conſider that they can exiſt, even in Peru, only in the cold regions; that is, on the top of the higheſt mountains; that they are never to be found in the valley, and die, if brought into hot countries. Conſequently, in order to preſerve them, they ſhould be landed, not in Spain, but in Scotland, and even in Norway, and with greater certainty at the foot of the Pyrenean, Alpine, or other mountains, where they might climb and attain to the region which is moſt conſentaneous to their nature.

The Unan, and the Ai.

Theſe two animals have the epithet of *ſloth* given to them both, by moſt authors, on account of the ſlowneſs of their walk. The unan has no tail, and only two nails on the fore feet. The ai has a ſhort tail, and three nails on every foot. The noſe of the unan is likewiſe much longer, the forehead higher, and the ears longer than the ai. It differs alſo in the hair. As for the internal parts, its viſcera are both formed and ſituated different; but the moſt diſtinctive, and, at the ſame time, the moſt ſingular character, is, that the unan has forty ſix ribs, while the ai has but twenty-eight. This alone ſuppoſes two ſpecies, quite diſtinct one from the other; and theſe forty-ſix ribs, in an animal whoſe body is ſo ſhort, is a kind of a prodigy in nature; for, even in the largeſt animals, and thoſe whoſe bodies are relatively longer than they are thick, none of them is found to have ſo many. The elephant has only forty ribs, the horſe thirty-ſix, the ram thirty, the dog twenty-ſix, and the human ſpecies twenty-four, &c. This difference in the conſtruction of the unan and the ai, ſuppoſes a greater diſtance between theſe two kinds than there is between that of the cat and the dog, which have the ſame number of ribs. Now the external differences are nothing in compariſon with the internal ones, which are the cauſes of the others. Theſe animals have neither inciſive nor canine teeth: their eyes are dull and heavy: their mouths wide and thick: their fur coarſe and ſtaring, and like dried graſs: their thighs ſeem almoſt disjointed from the haunch: their legs are very ſhort, and badly ſhaped. They have no ſoles on the feet, nor toes ſeparately moveable, but only two or three claws, exceſſively long, and crooked downwards and backwards. Deſtitute of teeth, they cannot ſeize any prey, nor feed upon fleſh, nor even upon vegetable food. Reduced to live on leaves and wild fruits, they take up a long time in crawling to a tree, and are ſtill longer in climbing up to the branches. During this ſlow and painful labour, which ſometimes laſts many days, they are obliged to ſupport the moſt preſſing hunger. When, at length, one of them has accompliſhed its end, it faſtens itſelf to the tree, crawls from branch to branch, and, by degrees, ſtrips the whole tree of its foliage. In this manner, it remains ſeveral weeks without moiſtening its dry food with any liquid; and, when it has conſumed its ſtore, and the tree is entirely naked, yet unable to deſcend, it continues on it till hunger preſſes, and that becoming more powerful than the fear of danger or death, it drops to the ground, without being capable of exerting any effort to break the violence of its fall.

On the ground, theſe animals are expoſed to all their enemies; and, as their fleſh is not abſolutely bad, they are devoured by men, and beaſts of prey. They ſeem to multiply but little, or, if they produce very often, it is only a ſmall number, as they are furniſhed but with two teats. Hence every thing concurs to their deſtruction, and the ſpecies ſupports itſelf with great difficulty. It is true, that, although they are ſlow, heavy and almoſt incapable of motion, yet they are hardy, ſtrong, and can abſtain a long time from food. Covered with a thick and coarſe fur, and ſcarcely able to move, they waſte but little, and fatten by reſt, however ſcanty their food be. Although they have neither horns on their heads, nor hoofs to their feet, nor inciſive teeth in the lower jaw, they are, notwithſtanding, among the number of ruminating animals, and have, like them, four ſtomachs. Hence they can compenſate for the quality of their food, by the quantity they take at a time; and, what is ſtill more ſingular is, that, inſtead of having, like other ruminating animals, inteſtines very long, theirs are very ſhort, like thoſe of the carnivorous kind.

Both theſe animals belong to the ſouthern parts of the New Continent, and are never to be met with in the Old. The unan, as well as the ai, is to be met with in the deſarts of America, from Braſil to Mexico; but they have never inhabited the northern countries. They can endure neither cold nor rain: the change from wet to dry, deſtroys their fur, which then reſembles badly dreſſed hemp, rather than wool or hair.

The Surikat.

This animal is a native of Surinam, and the other provinces of South America. It is very lively and ſubtle: it ſometimes walks on its hinder legs, and often ſits upright on them, with its fore paws hanging down by the ſide of its body. Its head is then erect, and moves upon the neck as on a pivot. It is not ſo big as a rabbit, and nearly reſembles the marmoſe in ſize: its tail is ſomewhat longer, and its ſnout is more prominent and raiſed. It is more like the coati than any other animal. Its character likewiſe is nearly original, ſince it neither belongs to the coati, nor to the hyæna. Theſe two are the only animals who have four toes on each foot.

This animals eats raw meat, and particularly poultry with a reliſh. It is fond of fiſh, and ſtill more of eggs. It will eat neither fruit nor bread. It makes uſe of its fore feet, like the ſquirrel, to convey its food to its mouth. It laps its drink like a dog, and will not touch water, unleſs it be luke-warm. Of one which I had in my poſſeſſion, its common drink was its own urine. It did not chew its food, but often ſcratched the brick or plaiſtered walls with its nails. It was ſo well tamed, that it anſwered to its name, when called: it went about the houſe like a cat, and had two voices; one like the barking of a young dog, when it was left long alone, or heard an unuſual noiſe. On the contrary, when it was careſſed, or when it ſhewed ſome mark of pleaſure, it made a noiſe as ſtrong as that of a rattle ſmartly turned. It was a female animal, and only lived one winter, notwithſtanding all the tender care taken of it.

The Tarſier.

The Tarſier is an animal remarkable for the length of its hind legs. The bones of the feet, and eſpecially thoſe which compoſe the upper part of the tarſus, are of an extraordinary ſize. It has five toes to every foot; it has, as I may ſay, four hands; for the toes are very long, and ſufficiently divided. The largeſt of thoſe behind, or the thumb, is terminated by a flat claw; and, although the claws of the other toes are pointed, they are, at the ſame time, ſo ſhort and ſmall, they do not prevent the animal from uſing its fore feet like hands. The jerboa, on the contrary, has only four toes, and four long and crooked claws, on its fore feet; and, inſtead of a thumb, it has nothing but a tubercle without any claw. What, however, removes it farther from our tarſier, is that it has only three fingers, or three great claws, in the hind feet.

The Phalanger.

Theſe animals, which have been ſent to us by the name of *Surinam rats*, have much leſs affinity with rats, than with the animals of the ſame climate of which we have given the hiſtory, under the names of the *marmoſe*, and *cayopoline*. As it has never been named by any artiſt or traveller, we have denominated it from its character, which is totally different from that of any other animal, and have called it *phalanger*, from its *phalanges* being ſingularly formed, and becauſe its two fore toes are conjoined in ſuch a manner, that this double toe appears like a hoof, ſeparated only near the claws. The thumb is ſeparated from the fingers, and has no claw at its extremity.

Theſe animals vary in the colour of the hair. They are about the ſize of a ſmall rabbit, or a very large rat, and are remarkable for the exceſſive length of their tail, ſnout, and the form of their teeth, which alone is ſufficient to diſtinguiſh the phalanger from the marmoſe, the ſariga, the rat, and every other ſpecies of animals with which it may be ſuppoſed to have any affinity.

The Coquallin.

This animal was ſent from America, by the name of the *oringe-coloured ſquirrel.* It is, however, not a ſquirrel, although ſufficiently reſembling it by the ſhape of the tail; for it not only differs by many external characters, but alſo by its nature and manners.

The coquallin is much larger than the ſquirrel. It is a beautiful animal, and very remarkable for its colours, its belly being of a fine yellow, and its head, as well as body, varied with white, black, brown, and orange. It covers its back with its tail, like the ſquirrel, but has not, like that animal, ſmall bruſhes of hair at the tips of the ears. It never climbs up any trees, and dwells in the hollows and under the roots of trees, like the animal we have termed *ſuiſſe.* In ſuch places, it builds its neſt, and rears up its young. It likewiſe ſtores its little habitation with corn and fruit, to feed on during the winter: it is a jealous and cunning animal, and ſo exceedingly wild, that it is impoſſible to be tamed.

The coquallin is only found in the ſouthern parts of America. The white and orange-coloured ſquirrels of the Eaſt Indies are much ſmaller, and their colours are uniform. Theſe are true ſquirrels which climb up trees, and produce their young on them. The coquallin, and the American ſuiſſe, burrow on the other hand, under the ground, like rabbits, and have no other affinity with the ſquirrel, than a reſemblance in the external form.

The Hamſter, or German Marmot.

The Hamſter, or German Marmot, is one of the moſt famous, and moſt pernicious rats that exiſt. We have fed one of theſe animals for many months, and afterwards had it diſſected, and obſerved, that the hamſter was more like the water-rat, than any other animal. It reſembled it in the ſmallneſs of its eyes, and the fineneſs of its hair; but its tail is not ſo long as that of a water rat; but, on the contrary, it is much ſhorter than that of the ſhort-tailed mouſe. All theſe animals live under the earth, and ſeem to be animated with the ſame inſtinct: they have nearly the ſame habits, and particularly that of collecting corn, &c. and making great magazines in their holes.

The habitations of the hamſters are different, according to the ſex, the age, and alſo the quality of the land they inhabit. That of the male hamſter is an oblique paſſage, at the entrance of which is a portion of earth thrown up. At a diſtance from this entrance, there is a ſingle hole, which deſcends in a perpendicular manner to the chambers, or cavities, of the habitation. There is no hillock of earth near that hole; which makes us preſume, that the oblique entrance is made hollow from the outſide, and that the perpendicular hole, by which they come out, is worked within from the bottom to the top.

The habitation of the female has alſo an oblique paſſage, with two, three, and even eight perpendicular holes, by which the young ones may go in and out, at pleaſure. The male and the female have each their ſeparate abode; but that of the female is deeper than that of the male.

The perpendicular hole is the common paſſage for coming in and going out. By the oblique tour, they throw out the earth they ſcratch up. This paſſage alſo has a gentle declivity into ſome of the cavities, and a ſteeper into others, which ſerves for a free circulation of the air in this ſubterraneous habitation. The cavity where the female breeds her young, contains no proviſion, but only a neſt of ſtraw, or graſs. The depth of the cavity is very different. The young hamſter, of a year old, makes its burrow only a foot deep, while the old animal often hollows it to the depth of four or five feet. All the cavities communicate together in one habitation, which is about eight or ten feet diameter.

Theſe animals ſtore their magazines with dry clover, corn, and other grain. They alſo provide themſelves with beans and peaſe. They are particularly careful to ſeparate all theſe from the huſk, which, with whatever elſe they do not make uſe of, they carry out of their habitation by their oblique paſſage.

The hamſter commonly ſtores up its winter proviſions at the latter end of Auguſt. When it has filled its magazines, it covers them over, and ſhuts the avenues to them carefully with earth. This precaution renders the diſcovery of theſe animals very difficult. The heaps of earth which they throw up before the oblique paſſage, are the only marks to trace their habitations. The moſt uſual method of taking them, is by digging them out of their holes, which is attended with much trouble, on account of the depth and extent of their burrows. One however that is dextrous in this buſineſs, commonly effects his purpoſe with good ſucceſs. In autumn, he ſeldom fails of finding two good buſhels of corn in each of their habitations; and he derives great profit from the ſkins of the animals. The hamſters bring forth their young two or three times in a year, and ſeldom leſs than five or ſix each time. Some years there are great numbers of them to be ſeen, and in others, ſcarcely any to be met with. They multiply in great numbers when the ſeaſons are wet, which occaſion a great ſcarcity of grain, by the devaſtation theſe animals make.

The hamſter begins to burrow at the age of ſix weeks, or two months. It never however, copulates in the firſt year of its growth.

The pole-cat is a great enemy to the hamſters, which he deſtroys in multitudes. He not only purſues them on land, but follows them into their burrows, and feeds on them.

The back of the hamſter is commonly brown, and the belly black. There are ſome however, of a grey colour; and this difference may proceed from their age. Beſides theſe, there are ſome often met with which are entirely black.

The hamſters deſtroy each other, like field-mice; two of them being put into the ſame cage, the female ſtrangled the male in the night-time; and, having divided the muſcles that held the jaws, ſhe devoured great part of his viſcera. There are numbers produced in one year, inſomuch, that, in ſome parts of Germany, a reward is fixed on their heads. Hence their fur is ſold exceedingly cheap.

The Bobak, and other Marmots.

The name of the *Straſbourg marmot* has been affixed to the hamſter, and that of the *Poland marmot* to the bobak: however, it is certain, that the hamſter is not a marmot; and it is probable, that the bobak, is one, as it only differs from the marmot of the Alps, by the colour of its fur, which is not quite ſo grey. There is a great claw, or toe, to the fore feet of the hamſter, while the marmot has only four toes to each foot; but in other reſpects it perfectly reſembles it, which make us preſume they do not form two ſeparate ſpecies. It is the ſame with reſpect to the Canadian marmot, or monax, which ſome travellers have termed the *whiſtler* It only ſeems to differ from the marmot in the tail, which has more hair.

The Canadian monax, the Poland bobak, and the Alpine marmots, are, probably all the ſame kind of animal, under different denominations. As this ſpecies prefers the coldeſt and higheſt mountains in Poland, Ruſſia, and other parts of the north of Europe, no wonder it is found in Canada, where it is only ſomewhat leſs than in Europe.

The Siberian animal alſo called by the Ruſſians *Jevras Chka,* is a kind of marmot, ſtill leſs than the Canadian monax.

Jerboa.

Jerboa is a generic name, which we make uſe of in this place, to denote thoſe remarkable animals whoſe legs are extremely diſproportionate; thoſe before being not above an inch long, and the others about two inches one fourth, and exactly like thoſe of a bird. There are four diſtinct ſpecies, or varieties of this kind. Firſt, the *Tarſier*, which we have already taken notice of, and which is certainly a particular ſpecies, as its toes are made like thoſe of a monkey, having five on each foot. Secondly, the *Jerboa,* whoſe feet are like the *fiſſipedes*, with four claws on thoſe before, and three on thoſe behind. Thirdly, the *Alagtaga*, whoſe feet are formed like thoſe of the jerboa, with this difference, that they have five toes on the fore, and three on the hinder feet, with a ſpur or a kind of thumb, or a fourth toe, much ſhorter than the reſt. Fourthly, the *Damon Iſrael*, or *Lamb of Iſrael*, which has four toes to the fore feet, and five to the hinder, which may poſſibly be the ſame animal which Linnæus has deſcribed by the name of of *Mus Longipes*.

The head of the jerboa is ſloped ſomewhat in the manner of a rabbit; but the eyes are larger, and the ears ſhorter, though elevated and open, with reſpect to its ſize. Its noſe and hair are of a fleſh colour, its mouth ſhort and thick, the orifice of the mouth very narrow, the upper jaw very full, the lower narrow and ſhort, the teeth like thoſe of the rabbit. The muſtacheos are compoſed of long black and white hairs. The fore feet are very ſhort, and never touch the ground; they are furniſhed with four claws, which are only uſed as hands to carry the food to the animal's mouth. The hind feet have but three claws, the middle one longer than the other two. The tail is three times as large as its body, and is covered with ſhort, ſtubborn hair, of the ſame colour as that on the back, but tufted at the end with longer and ſofter hair. The legs, noſe and eyes are bare, and of a fleſh colour. The upper part of the head and back are covered with an aſh-coloured hair. The ſides, throat and belly are whitiſh; and below the loins, and near the tail, there is a large, black, tranſverſal band, in the form of a creſcent.

Theſe little animals commonly conceal their hands, or fore feet, within their hair; which hath induced ſome to imagine that they have only hinder feet. When they move from one place to another, they do not advance one foot before the other, but jump, or bound, about four or five feet at a time. This they do with the greateſt eaſe and ſwiftneſs, holding themſelves erect, like birds when they hop on the ground. They reſt themſelves in a kneeling poſture, and only ſleep in the day. In the night-time, they ſeek for their food, like hares, and, like them, feed on graſs, corn, and other grain. They are of a gentle nature, but not to be tamed beyond a certain limit. They burrow like rabbits, and in much leſs time. They lay up ſtore of graſs, about the latter end of ſummer, in their habitations, and, in cold countries, remain in them during the winter. They are found in Syria, Phœnicia, Barbary, &c.

Ichneumon.

This animal is domeſtic in Egypt, like our cat; and like it, is ſerviceable in deſtroying rats and mice; but, its inclination for prey, and its inſtinct is much ſtronger, and more extenſive than that of the cat; for it hunts alike, birds, quadrupeds, ſerpents, lizards, and inſects. It attacks every living creature in general and feeds entirely on animal fleſh. Its courage is equal to the ſharpneſs of its appetite: it is neither frightened at the anger of the dog, nor the malice of the cat, nor even dreads the bite of the ſerpent. It purſues them with eagerneſs, ſeizes on and kills even the moſt venomous of them. As ſoon as it begins to feel the impreſſions of their venom, it immediately ſearches for antidotes, and particularly a root that the Indians call by its name, and which, they ſay, is one of the moſt powerful remedies in nature, againſt the bite of the viper. It ſucks the eggs of the crocodile, as well as thoſe of fowls and birds. It alſo kills and feeds on very young crocodiles, and, as fable ſometimes accompanies truth, it has been currently reported, that, by virtue of this antipathy, the ichneumon enters the body of the crocodile, when it is aſleep, and never quits it till it has devoured its entrails.

Naturaliſts have ſuppoſed that there are many kinds of ichneumons, becauſe there is a difference in their ſize and in the colour of their hair. If we conſider, however, that, being frequently reared in houſes, they have, like other domeſtic animals, undergone varieties, we ſhall readily perceive, that this diverſity of colour, and this difference of ſize, only points out ſimple varieties, not ſufficient to conſtitute a ſeparate ſpecies. It alſo appears, that the ichneumons in Egypt, which may be called domeſtic, are larger than thoſe in India, which are in a wild ſtate.

The ichneumon lives very willingly by the ſides of rivers, inundations, and other waters. It quits its habitation to ſeek its prey near habitable places. It ſometimes carries its head erect, ſhortens its body before, and raiſes itſelf upon its hind legs. At other times, it creeps and lengthens itſelf like a ſerpent: it often ſits upon its hind feet, and oftener ſprings upon its prey: its eyes are lively, and full of fire: its aſpect is beautiful, the body very active, the legs ſhort, the tail thick and very long, and the hair rough and briſtly. Both male and female have a remarkable orifice, independent of the natural paſſages. It is a kind of pocket, into which an odoriferous liquor filters. The animal is ſaid to open this bag, or pocket, to refreſh itſelf when too hot. Its noſe is very ſharp, and its mouth narrow, which prevents it from ſeizing and biting any thing very large; but this defect is amply compenſated by its agility, courage, and by its power. It very eaſily ſtrangles a cat, although much bigger and ſtronger than itſelf. It often too fights with dogs of every ſize; and it for the moſt part obtains the victory.

The Foſſan.

The foſſan is called, by ſome travellers, the *Genet of Madagaſcar:* but it is, in general, far ſmaller than the genet; and beſides it has no odoriferous bag, the eſſential attribute of that animal. Its manners are much like thoſe of our pole-cat; and, when the male foſſan is particularly amorous, it emits a very ſtrong ſmell like muſk. It eats both fleſh and fruit, but prefers the laſt. It is a very wild animal, and very difficult to be tamed. The eye of the foſſan repreſents a black globe, very large in compariſon with the ſize of its head, which gives this animal a miſchievous look.

The animal called *Berba* in Guinea, ſeems to be the ſame as the foſſan, conſequently this ſpecies exiſts in Africa, as well as in Aſia.

The Vanſire.

Thoſe who have ſpoken of this animal, have taken it for the ferret, which indeed it reſembles in many reſpects, though it differs from it by characters ſtrong enough to make it a diſtinct ſpecies. The vanſire has twelve teeth, or grinders, in its upper jaw, while the ferret has only eight. The vanſire alſo differs in the colour of its hair, from all ferrets; although thoſe, like every other animal which man is eager to rear and increaſe, vary much, both male and female.

The animal called by ſome the *Weaſel of Java,* and by others the *Ferret of Java,* may poſſibly be the ſame with the vanſire.

The Maki.

This name of Maki has been given to many different kinds of animals. The firſt claſs is the mocock, or maucaucau. The ſecond is the mongooz, generally called the *brown maki;* and the third kind is the vari, which ſome call the *pied maki.*

The maucaucau is a beautiful animal, remarkable for the largeneſs of its eyes, and the length of the hinder legs, which far exceed thoſe before. It is alſo ornamented with a long tail, continually elevated and in motion, upon which are upwards of thirty rings, alternately black and white, all very diſtinct and ſeparate from one another. It is gentle; and, although it greatly reſembles the monkey in many particulars, it is not ſo malicious in its nature. It is a gregarious animal, commonly found in ſociety in its natural ſtate. In Madagaſcar, thirty or forty are ſeen herding together. It ſleeps in a ſitting poſture, with its ſnout reſting upon its breaſt: its body is no thicker than that of a cat; but it is longer; and it appears larger, as the legs of the animal are very long. The hair is very ſoft, and ſtands almoſt erect.

The mongooz is leſs than the maucaucau; but its hair is, like that, of a ſhort and ſilken nature, but a little curled. Its noſe is alſo thicker, and very like that of the vari. I had a mongooz in my poſſeſſion for ſeveral years: its coat was of a brown colour, the eyes yellow, the noſe black, and the ears ſhort. It had a cuſtom of playing with and biting its tail, and had, by this method, leſſened it by four or five of the laſt vertebræ. Whenever it got looſe, it viſited the ſhops in the neighbourhood, and would make free with fruit, ſugar, ſweetmeats, &c. to obtain which, it would open the boxes. At ſuch times, it was difficult to retake it; and it would even bite its keeper.

The vari is much larger, ſtronger and wilder than the maucaucau, and is even exceedingly ſavage and miſchievous in its free ſtate. Travellers tell us, that it is as furious as a tiger, and very difficult to be tamed; and that its voice is ſo very loud, that, when there are only two together in the woods, one would naturally imagine, that the noiſe they made, proceeded from an hundred. Its hair, in general, is much longer than that of the maucaucau; and it has a kind of ruff round the neck, conſiſting of very long hair. In other reſpects, its hair is black and white, and, although very long, ſtands almoſt erect. Its ſnout is thicker and longer than that of the maucaucau; its ears are much ſhorter, and edged with long hair; and its eyes are of ſo deep an orange colour, that, if not minutely inſpected, they appear red.

The maucaucau, the mongooz, and the vari, are all of the ſame country. They ſeem to be confined to Madagaſcar, Mozambia, and the neighbourhood of theſe iſlands.

The Lori.

The Lori is a little animal, found in Ceylon, very remarkable for the ſingularity of its conformation. It is, perhaps, of all animals, the longeſt in proportion to its ſize, having nine vertebræ in the loins; whereas other quadrupeds have only five, ſix, or ſeven. Its body appears longer as it has no tail. In other reſpects, it reſembles thoſe of the maki kind, as well in the hands and feet, as in the quality of the hair, the number of teeth, and the ſharpneſs of its ſnout. This animal ſeems to be the ſame as that which Thevenot ſpeaks of in the following terms:—" I ſaw," ſays he, " a monkey at Mogul, which had been brought thither from Ceylon. It was greatly valued on account of its ſize, it being no bigger than a man's fiſt. It is a different kind from the common monkey, having a flat forehead, eyes round and large, and of a bright yellow colour, like thoſe of ſome cats. Its ſnout is very pointed: the inſide of the ears is yellow: and it had no tail. When I examined it, it ſat erect on its hind feet, folded the others acroſs its breaſt, and looked around it, at the ſpectators, without betraying the leaſt ſymptom of fear.

The Javelin Bat.

The animal in queſtion, we have denominated the *javelin bat*, from a ſort of comb, or membrane, on its noſe, which perfectly reſembles the head of a lance. Although this character alone is nearly ſufficient to diſtinguiſh it from all other animals, yet we can add that it has ſcarcely any tail, and that its hair and ſize are nearly like thoſe of the common bat, with this difference, that inſtead of having ſix inciſive teeth in the lower jaw, it has only four. This kind of bat is very common in America, and never found in Europe.

There is another bat in Senegal, which has alſo a membrane upon its noſe, in the ſhape of an oval leaf. Theſe three bats, being of different climates, are not ſimple varieties, but diſtinct and ſeparate ſpecies.

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